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SUGAR IN RELATION TO THE TARIFF

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SUGAR IN RELATION TO THE TARIFF

BY

PHILIP G. WRIGHT

WITH THE AID OF THE COUNCIL AND
STAFF OF THE INSTITUTE OF ECONOMICS

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DIRECTOR'S PREFACE

The tariff constitutes the most important expression of the trade policy of the United States. It is for this reason that the Institute of Economics has selected it as the first subject of study in the field of international commercial policies.

It is the intention of the Institute to present ultimately an analysis and constructive criticism of the American tariff system as a whole. There has been an abundance of abstract theorizing in the United States about the principles of protection and free trade, and there has been no dearth of statistical data submitted by interested parties. But, unfortunately, there has been very little effort at dispassionate investigation of the concrete effects of tariff legislation from the point of view of the public welfare. The tariff is not a single problem to be disposed of by the application of any one general formula. It presents a wide range of concrete questions of public policy with reference to each particular industry. Hence, the economic significance of tariff legislation can be disclosed only if the problem is approached inductively, through an analysis of the structure and organization of specific industries and of the effects of tariff changes thereon. Before attempting any broad generalizations regarding the wisdom of American tariff policy as a whole the Institute will therefore first present a series of special

investigations dealing with the relation of the tariff to particular lines of production in the United States.

The present study of the tariff on sugar is one of several designed to reveal the relation of the tariff to agriculture. This group of commodities has been selected not only because of its economic importance but also because it best illustrates the wide diversity of considerations that must be weighed before appraising our general tariff policy. The other investigations in the series will deal with the tariff in relation to wool growing, the cattle industry, cotton growing, wheat farming, and the production of vegetable oils. They will be followed by a general discussion of the effects of the tariff as a whole upon American agriculture.

This study has been submitted in whole or in part to men representing both sides of the questions in controversy. To the suggestions received the author and members of the Council of the Institute have given earnest consideration. If the conclusions reached in this study do not altogether accord with those of the divergent interests concerned, it is therefore not because the Institute has failed to take certain practical considerations into account. It is rather due to the fact that the Institute is concerned with the broad question of the effects of the sugar tariff upon the nation as a whole. The reader will find the conclusions of the study stated on pages 244–253.

H. G. MOULTON,
Director.

WASHINGTON, D. C.
January, 1924.

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The author would also express grateful acknowledgment to persons not connected with the Institute, some of whom have read the manuscript and given suggestions based on their practical knowledge and experience. Special mention should be made of the following: Dr. Joshua Bernhardt, Chief, Sugar Division, United States Tariff Commission; Dr. C. O. Townsend, Special Expert, Sugar Division, United States Tariff Commission; Mr. Truman G. Palmer, Statistician and Sugar Expert; Mr. John M. Rogers, Washington Representative, Sugar Cane League of the United States of America; Mr. Royal D. Mead, Washington Representative, Hawaiian Sugar Planters Association; Mr. Frank C. Lowry, of the firm of E. Atkins and Company, Sugar Brokers; and Mr. M. Doran, Representative of the United States Sugar Association.

PHILIP G. WRIGHT.

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SUGAR IN RELATION TO THE TARIFF

SCOPE AND CONCLUSION OF THE STUDY

By two tariff acts closely following one another (the Act of May 27, 1921, and the Act of September 21, 1922) the duty on sugar has been increased, first, to 60 per cent and then to 76 per cent above the previous rate provided by the Act of 1913. So great an increase in duty, portending as it did a probable rise in the price of a universally consumed article of food, could not fail to direct public attention to the subject of sugar.

PUBLIC INTEREST IN SUGAR

The war experience, wide price fluctuations, and the propaganda of private interests have also in recent years helped to keep sugar prominently before the public. During the war, through the agency of the Food Administration, the price of sugar was fixed and its distribution regulated. During that period also there were several acute "sugar famines." Households could not obtain sugar in quantities sufficient for their ordinary needs—sometimes not at all. Following the war sugar went through the most remarkable price

fluctuations in its history. The abandonment of government control at the end of 1919 and the memory of past scarcity made buyers apprehensive of another shortage. This resulted in a rapid and unprecedented rise in price until on May 19, 1920, the landed price of Cuban raws in New York touched 22.50 cents per pound. The precipitous rise was followed by a no less precipitous fall. The decline continued through the rest of 1920 and through 1921; and by the end of the latter year the landed price had fallen to 1.81 cents per pound. Throughout 1922 it rose gradually, and much more rapidly in the early months of 1923. This latter rise greatly aroused the public and resulted in a government investigation, a "sugar boycott" by housewives, and no little controversial literature. On the one hand it was attributed to the recent advances in the rate of duty; on the other hand to the pernicious activity of speculators. There were elements of truth in both these allegations, but, as will be shown later, the rise was in fact mainly due to the operation of the familiar law of supply and demand, the controversial literature being in the nature of political propaganda emanating from private business interests.

The great seaboard refineries and the American investors in Cuban sugar properties have a tariff interest diametrically opposed to that of the domestic cane and beet sugar producers. Both parties have a very direct pecuniary interest in the tariff and both are in a position to employ the best legal and literary talent in impressing Congress and

the general public with their views. Hence it follows that most of the articles that appear in regard to sugar in its relation to the tariff are of the nature of attorneys' briefs for their clients. It is for the interest of the seaboard refineries and the American investors in Cuban sugar properties, since they would be pecuniarily benefited by a decrease in the rate of duty, to attribute the high price of sugar in the spring of 1923 to the tariff and thereby arouse public indignation against the high rates of duty recently enacted. It is for the interest of the domestic cane and beet sugar producers, since they are pecuniarily benefited by the high rates of duty of the acts of 1921 and 1922, to divert public scrutiny from the tariff by arousing indignation against New York speculators. For these reasons a dispassionate study of the sugar question should be welcome and timely.

The sugar duty is important from a revenue standpoint as well as from the standpoint of protection. From it is derived more revenue than from any other single item in the tariff. Indeed, about one-fourth of the entire customs receipts is derived from sugar. The proper magnitude of the duty for revenue purposes, its methods of collection, and its burden upon taxpayers are all questions inviting discussion.

Finally, the case of sugar is one of great interest in connection with the "flexible provision" of the tariff act of 1922. That act provides that the President, acting upon information furnished by the Tariff Commission, may change by an amount

not to exceed 50 per cent rates which are found not to equalize costs of production between foreign and domestic producers, so that the substituted rate shall equal this difference. Sugar production is one of the comparatively few industries from which it will be possible to secure accurate foreign and domestic costs by schedules direct from the mills. It therefore affords an exceedingly interesting test of the feasibility of this method of tariff adjustment.

PLAN OF THE PRESENT STUDY

The study is divided into two main parts. Part I is designed to afford the reader a background of knowledge in regard to the sugar industry. It consists of three chapters. Chapter I treats of the character of the industry; its division into a cane and a beet sugar industry; the regions in which both of these branches flourish; the processes involved in production in the several stages, agricultural, manufacturing, and refining; the effect of the industry upon the soil; and the character of the labor employed. Chapter II treats of the growth of the domestic industry to its present position; its distinguishing characteristics in each of the regions where it flourishes; and its importance as an absorber of capital and labor in each of these regions. Chapter III is devoted to tables of statistics, with comment, relating to production, consumption, imports, exports, and revenue.

Part II deals with sugar in its relation to the tariff. Chapter IV is historic, stating what have

been the duties upon sugar in successive acts; their magnitude and mode of assessment, whether specific or ad valorem; and the tests for establishing the different grades. A table giving the rates of duty upon sugar in the principal countries of the world is appended. Chapter V undertakes to discuss on grounds of both economic theory and statistical evidence the extent to which the domestic sugar industry is dependent upon the tariff. Chapter VI attempts to show by a statistical analysis the effects upon prices, imports, and domestic production brought about by changes in the rate of duty. Chapter VII is devoted to a discussion of the protection involved in transportation charges. Chapter VIII states and discusses the leading arguments which have been advanced for and against a duty on sugar. Chapter IX presents the conclusions of this study.

PURPOSE OF THE PRESENT STUDY

Before stating what the purpose of the present study is, it should be clearly stated what it is not. It is not to undertake an abstract discussion of the merits of protection as a principle of national policy nor of the merits of a customs tariff as a method of taxation. It is provisionally assumed that the United States is to continue its historic policy of maintaining a customs tariff as a part of its fiscal system and that the tariff will be used in the future as in the past as a means of raising revenue and also as a means of affording protection

to domestic industries. With this assumption the problem approached becomes definite and concrete. It is to determine:

1. Whether, after giving due consideration to all the conflicting interests concerned, sugar should be dutiable or on the free list.

2. If dutiable, what principles should determine the rate to be assessed and what the specific rate should be.

Incidental to these main purposes are several subsidiary aims:

1. To furnish a background of general information in regard to sugar, which may assist the reader in forming an independent judgment on the tariff problem.

2. To investigate the relation between the costs of production of sugar and its price.

3. To determine the extent to which the domestic industry is dependent upon the tariff and to estimate the effect of changes in the tariff upon prices, imports, and the domestic industry.

4. To repeat and to weigh the various arguments, pro and con, which have been advanced in favor of a duty on sugar.

CONCLUSION

For the benefit of those who desire to know the result of this study in advance of its reading, the final conclusion may be stated as follows:

A careful weighing of all the arguments and of all the results developed by the inquiry leads to the conclusion that from the standpoint both of revenue

and protection sugar is a suitable commodity to be subject to a moderate rate of duty. A rate which will maintain roughly the present proportions of domestic and foreign sugars in the domestic market is recommended. From the best data now available a rate of from 1.25 to 1.5 cents per pound on 96° Cuban centrifugals is suggested as adequate to accomplish this purpose.

For a summary of the discussion and a more amplified statement of the conclusions reached and the reasons for reaching them the reader is referred to Chapter IX, pages 237–253.

PART I

GENERAL INFORMATION

CHAPTER I

CHARACTER OF THE SUGAR INDUSTRY

Sugar is a product of nature elaborated out of air and water by the action of sunshine in the sap of various plants. Among these plants the most important are the sugar cane, the sugar beet, the palm, and the maple tree. There are many others, however, from which sugar may be extracted, some yielding sugar of the same kind as that extracted from the cane or beet and others a different kind. The term "sugar" as used in chemistry covers a series of carbohydrates [1] differing in chemical formula and properties.

The familiar sugar of the household is sucrose ($C_{12}H_{22}O_{11}$). Of the other "sugars," the most important are two isomeric forms, dextrose and levulose, having each the same formula ($C_6H_{12}O_6$) but differing in the particular that dextrose twists a beam of polarized light to the right and levulose twists it to the left. When mixed together in equal proportions, the compound is known as "invert sugar," which, because of the preponderating effect of the levulose, still twists a beam of polarized light to the left. These last-named sugars are not only commercially important in themselves, being the

[1] Carbohydrates are substances containing carbon, hydrogen, and oxygen, the general formula being $C_x(H_2O)_y$.

basis of such well-known substances as glucose, grape or corn sugar, and honey, but they are also of importance in connection with the sugar industry proper. In the process of manufacture, some of the sucrose molecules take on a molecule of water and then break up into two molecules, one of dextrose, and the other of levulose.[1] The invert sugar so formed, together with some sucrose which escapes, water, and various impurities, constitutes molasses, an important by-product of the sugar industry.

The sugar industry is widespread—cane sugar in tropical, and beet sugar in temperate, regions. The only sugars to be considered in this paper are cane sugar and beet sugar and, incidentally, their by-products. Cane sugar is extracted from the sugar cane, a plant of the grass family, which reaches its most perfect development in the tropics, though it may also be grown in semitropical regions. Cuba, Java, India, and several South American and West Indian countries are among the most important cane-sugar regions.

Of regions under the American flag, cane sugar is produced in Louisiana and Texas, Hawaii, Porto Rico, the Philippine Islands, and the Virgin Islands. All these regions, except those within the continental United States, are tropical, and in them the

[1] The reaction may be thus expressed: $C_{12}H_{22}O_{11}+H_2O=C_6H_{12}O_6$ (dextrose) $+C_6H_{12}O_6$ (levulose). It will be noted that the two molecules in the right-hand member of the equation are made up each of the same number of the same kind of atoms. The atoms being presumably differently arranged, the substances differ in some of their properties. Such substances are said to be isomeric.

cane may grow for twelve months or more before harvesting. In Louisiana, however, the cane can grow for only eight or nine months before it is cut down by frost. This fact has an important bearing on the Louisiana industry. Immature cane is less rich in sucrose but contains a considerable percentage of invert sugar. The yield of sugar per ton of cane in Louisiana is about 143.26 pounds; while in Hawaii it is 245.63 pounds; in Porto Rico, 221.87 pounds; and in Cuba, 229.07 pounds.[1] On the other hand, the higher percentage of invert sugar in the Louisiana cane renders the production of molasses relatively much more important than in the other regions named. These facts have a bearing on the tariff problem. (See Appendix G.)

The chief sources of beet sugar are the countries of Europe, the United States, and Australia. The sugar beet grows best in a temperate climate favored with abundant sunshine, a cool, dry air, and moisture timed to certain periods of its growth. Moisture is needed when the seed is germinating and the beets are forming; later, when sugar is being elaborated, too much moisture tends to produce large size and small sugar content; but if several weeks elapse between the rains and harvesting, the beets recover their high sugar content. The industry is best adapted to such regions as Colorado, Utah, and California, where moisture is supplied by irrigation.

[1] The Cane Sugar Industry: U. S. Dept. Comm. Misc. Ser. 53, p. 27, 1917. The results are not all for the same year. The data for Louisiana were collected in 1913–14, and for the other regions in 1915–16.

Michigan is also an important center of the beet-sugar industry. But there growth is dependent on natural rainfall and hence the beet crop is less reliable.

I. STAGES OF THE INDUSTRY

The sugar industry includes four distinct stages which, however, often overlap with respect to management. From what has been said it appears that the sugar industry includes several distinct phases: (1) The production of the cane or beets, an agricultural process. (2) The manufacture of raw sugar from the cane or beets, a factory process. (3) The refining of the raw sugar into various commercial grades, also a factory process. (4) The distribution of the refined sugar among consumers, a commercial process.

It frequently happens, however, that two or more of these successive stages are conducted under the same management. In the United States all the beet-sugar factories are also refineries, and some of them also undertake the agricultural stage, operating farms and producing their own beets. In the cane-sugar industry, moreover, the production of the cane and the manufacture of raw sugar are often under the same management, and in Louisiana many of the factories carry the process beyond the raw stage and prepare for market merchantable grades—"plantation granulated," "yellow clarified," or even strictly refined sugar. The great bulk of the cane sugar, both domestic and foreign, which is consumed in the United States is, however,

purchased in a raw state and is refined for market by the great seaboard refineries as a wholly separate undertaking. But even here there is an overlapping. Some of the seaboard refineries are interested in Cuban plantations and centrals [1] and one of them is undertaking the development of sugar production in Florida.[2]

On the other hand, the Hawaiian Islands producers, who operate factories and secure the greater part of their cane from their own plantations, also, through an organization, own a refinery on the Pacific coast. Some of the great New York sugar brokers, whose functions are primarily distributive, finance and own Cuban centrals, arrange credits for transportation of sugar, own and operate refineries, and do a brokerage business in raw and refined sugar, thus integrating the industry in all its phases and affording an interesting example of an apparent evolution of the industry toward the dominance of its financial end.

1. The Agricultural Stage.—The agricultural stage is closely associated with the manufacturing stage and is of predominant importance with respect to costs. The raw materials, cane or beets, are bulky in comparison with their value, and it is not profitable to transport them long distances. The sugar factories are, therefore, found in the midst of the

[1] Sugar factories in Cuba and Porto Rico are known as "centrals" (accent on the last syllable).

[2] The Florida interests are owned by George Earle, who also owns the Pennsylvania Sugar Refining Company. He operates his Florida estates under the name of the company, though the company is leased to E. Atkins & Company.

cane or beet fields and a practical limit is imposed on their size.

In the beet-sugar industry, though some of the factories, as just noted, cultivate their own beets, the general practice is to make contracts with the surrounding farmers. The contracts are signed before the planting of the beets. The terms are very definitely drawn and usually provide for a basic price to be paid for the beets with sliding-scale increments dependent upon the sugar content and the price received for sugar. (See Appendix A, pp. 257–67.) The farmer's profits, therefore, like those of the corporation running the factory, are partly dependent upon the price of the finished product, and his tariff interests are thus tied up with those of the factory.

In Hawaii, the factories and plantations are in general operated under a single management, though some cane is purchased by the factories under contract with independent growers. Huge irrigation projects have been engineered. Intensive cultivation and heavy investments in fertilizers and plantation machinery characterize the industry in this region. The extraction of the sugar from the cane represents a comparatively small portion of the total expense. In Cuba, the factories are much larger than in Hawaii and, while some of the plantations are operated by the factory management, more commonly the cane is cultivated by independent "colonos," who sell it to the factories or centrals and take their pay either in actual sugar or, more commonly, in credits for sugar, based on

the Cuban price. In Louisiana, also, a large part of the cane is purchased by the factories. In Porto Rico, the relation between the centrals and the colonos is similar to that in Cuba.

Data secured by the United States Tariff Commission show that about two-thirds of the total cost of producing sugar is incurred at the agricultural end of the business, though the proportion differs greatly in different regions. Manufacturing costs account for from one-fifth to one-third of the total, the remainder being absorbed by depreciation and marketing expenses. The industry is thus shown to be predominantly agricultural. Nevertheless, sugar factories represent no inconsiderable investment. The average size of the factories shows a rather surprising disparity in the different regions. For cane sugar, the average factory represents an investment of $374,000 in Louisiana, of $481,000 in Hawaii, of $2,480,000 in Porto Rico, and of $3,277,000 in Cuba. For domestic beet sugar the average factory investment is $2,041,800.[1]

Sugar cane is propagated from "seed" cane or from ratoons. When the cane is harvested, two courses may be pursued with reference to the next year's crop. If the roots are left in the ground, new shoots or ratoons will spring from them and a crop may thus be obtained without further planting.

[1] Figures furnished by the United States Tariff Commission from data for the year 1921. In the domestic beet-sugar industry the factory investment covers plant and machinery for carrying the process through to refined sugar. This is also true of some of the factories in Louisiana. The other regions terminate the process with raw sugar.

Or a certain proportion of the crop of canes may be reserved as "seed" cane and planted in furrows. Sprouts spring from the joints and provide the next crop. So admirably adapted to the growth of cane are the soil and climate of Cuba that the cane may often be profitably ratooned for ten or more years. In Louisiana, on the other hand, it is not profitable to ratoon for more than one year. The third year the land is usually plowed and planted to some nitrogenous crop, such as cowpeas. It will be seen that in this respect Cuba possesses a considerable advantage.

The cultivation of sugar beets is beneficial to the soil. The chemical formula for sugar is, as was stated, $C_{12}H_{22}O_{11}$; that is, it is made of carbon and water. The carbon is obtained from the air and the water from the ground. It will thus be seen that sugar depletes the soil of none of its valuable mineral constituents. Such minerals are, of course, present in the cane and beets from which the sugar is derived, but with proper care they may to a considerable extent be restored to the soil. In the case of the cane-sugar industry the bagasse or crushed cane from which the juice has been extracted is usually used for fuel or sometimes as a raw material for the manufacture of paper, and hence the minerals which it contains are lost to the soil. The "trash," however, resulting from the cutting of the cane may be plowed under. In the beet-sugar industry the refuse from the filter presses may be returned directly, and the tops, beet pulp, and beet molasses indirectly, to the soil by feeding them to cattle.

Some beet-sugar factories raise cattle as an adjunct to their sugar business, but the general practice is for the independent farmers in the vicinity to utilize the tops, pulp, molasses, and filter cake. The tops they retain as forage when they cart their beets to the factory; the other items they obtain from the factory. It is thus seen that, from the standpoint of conservation, the cultivation of the sugar beet is a branch of agriculture to be fostered.

In other ways also the industry is desirable. The cultivation of the sugar beet requires deep plowing, careful preparation of the soil, and intensive methods, and therefore leaves the soil in excellent condition for certain other crops. Moreover, the beet sends out minute rootlets which ramify through the soil to a considerable depth. When the beet is removed, these rootlets decay, but leave minute capillary pores which retain moisture and thus afford a subsoil irrigation. Experiments made in Germany by Dr. Gustav Humbert show a marked difference in the yield of various crops under apparently similar conditions, except that in one set of experiments sugar beets were raised in proper rotation with the other crops and in the other set no sugar beets were raised. The results of these experiments are shown in Table I.

Dr. C. O. Townsend,[1] of the Bureau of Plant Pathology of the United States Department of Agriculture, states that while the Department has not published the results of its studies along this

[1] Since the above was written Dr. Townsend has joined the staff of the U. S. Tariff Commission.

TABLE I.—Average Yield per Acre of Crops Specified on Estates where Beets were Raised in Proper Rotation, Compared with Yield per Acre of Same Crops on Similar Estates where no Beets were Raised *

Crops	Average per acre of total area			Average per acre under crops			Yield during period	
	Beet estates	Nonbeet estates	Excess	Beet estates	Nonbeet estates	Excess	Maximum	Minimum
			Per cent			*Per cent*		
Wheat.....bushels...	35.4	29.6	19.6	36.0	31.1	15.7	42.5	23.5
Rye.....bushels...	31.1	28.9	7.6	30.1	28.4	5.9	33.5	20.6
Barley.....bushels...	43.5	33.7	29.1	45.7	35.5	28.7	53.1	29.4
Oats.....bushels...	57.5	43.8	31.3	60.7	43.1	40.8	80.8	31.8
Peas.....bushels...	27.8	19.1	45.5	29.3	16.8	74.4	52.3	16.0
Rapeseed..pounds....	1,246.0	1,207.0	3.2	1,270.0	1,071.0	19.4		
Potatoes...bushels...	203.6	187.1	8.8	212.7	199.6	6.5	232.0	154.7
Beets.....pounds....	24,465.0	.....	.....	28,919.0				
Seed beets..pounds...	1,717.0	.....	.....	1,865.0				

* Palmer, Truman G., Experiments by Dr. Gustav Humbert in Saxony (1855–74): Loose-leaf Service Concerning Sugar, p. A–12, 1922.

As a basis of his statistics, Humbert selected 31 large and middle-sized estates in the province of Saxony. The data he used were from original accounts of the 31 estates and cover ten or, for some estates, twenty or even thirty years. Most of the figures used for comparative purposes are ten-year averages, though some of them cover two decades, 1855–64 and 1865–74, as affected by the introduction of beet culture into the cycle of rotation. Twenty-six of the estates produced beets, and five produced no beets. Humbert states that the soil of the nonbeet estates was of slightly better quality than that of the beet-growing estates, and that they had the further advantage of being larger estates. He says that the difference in the methods of cultivation between the beet-growing and the nonbeet-growing estates consisted primarily in the elimination by the farmer of the idle fallow fields and the partial substitution of beet raising for the production of fodder plants and meadow grasses. The statistical analysis of the figures of combined yields shows that under like climatic and soil conditions the yield of the beet estates was almost 45 per cent larger than that of the nonbeet estates. It is remarkable that in comparing all farms in general and the yield thereof, the highest average yields are found on beet farms only, whereas the lowest yield is always reported from the beetless farms.

line in the United States, they abundantly confirm the German experience. Crops of small grains (wheat, rye, barley, and oats) are improved about 25 per cent when grown in rotation with the sugar beet. A common rotation is to follow beets with one of the small grains and then to sow to clover or alfalfa for one or two years before another beet crop. Corn is not improved by being grown in rotation with beets. Aside from the benefit to some other crops when the beets are grown in rotation, it is poor practice to follow beets with beets because of the likelihood of developing insect pests when beets are grown several succeeding seasons on the same land.

2. The Factory Stage.—Whether derived from cane or beet, the processes involved in sugar manufacture are essentially the same. The juice is first extracted, from cane by crushing between rollers, and from beets by a diffusion process similar in principle to steeping tea. The juice is then clarified, evaporated, and boiled down until the sugar crystals have appeared and grown to the requisite size. The mass containing the sugar crystals immersed in the "mother liquor" and known as "massecuite" is then subjected to centrifugation, which separates the sugar from the molasses.

The raw sugar above described usually tests about 96° by the polariscope; and the "96° centrifugals" form the basis for all price quotations of raw sugar. Some sugar, however, of a considerably lower test is still manufactured by an antiquated "open-kettle" process and separated from the molasses

in perforated barrels. Such sugar is known on the market as "muscovado" sugar.

Sugar factories operate from three to nine months of the year. In none of the regions of domestic sugar production is it customary to keep the factories in operation throughout the entire year. The nearest approach to continuous operation is in Hawaii. There it is customary to have three crops of cane growing simultaneously, one in process of being harvested, another in mid-growth, and a third in growing shoots just sprouted. The factories begin grinding in December and usually close operations in the following autumn. In Cuba and Porto Rico the grinding also begins in December or January but, because of the coming on of the rainy season, terminates in June. In Louisiana the grinding begins in November and ends in January. The same period applies also to the domestic beet-sugar industry, except in California, where the slicing begins earlier. It will thus be seen that in the domestic beet and Louisiana industries the factories are active for only three months of the year, a condition involving much idle capital. Some large plants in Louisiana overcome this difficulty in part by operating during the idle season as refineries.

3. The Refining Stage.—The "raw" sugar obtained from the factories is purchased by the refineries. In the refinery the raw sugar is "melted" in water, again subjected to centrifugation, passed through a succession of filters, of which the most important for removing discoloration is the bone-black filter. The sugar derived from the last filtrate is nearly

100 per cent pure. It is then prepared for marketing in such forms as granulated, cubes, powdered, and loaf.

4. The Commercial Stage.—When the sugar has been refined, it enters the channels of trade through sugar brokers, who buy and sell on commission for the refiners on one side and the wholesale and retail trade on the other. The dominating market is New York. In this market the buying and selling operations fix the market price from day to day. These buying and selling operations include not only those in which there is an actual material transfer of sugar from the refiners to wholesale and retail dealers, but also the operations of the coffee and sugar exchange. Here sugar is bought and sold for future delivery and the various forms of speculation in futures characteristic of other exchanges, such as the corn, wheat, and cotton exchanges, take place. It was against the coffee and sugar exchange that the activities of the Department of Justice were directed in connection with the rise of prices in the spring of 1923.

Large-scale operations are conducive to economy in the factory and refining stages of the industry. The cost studies made by the Tariff Commission show a marked inverse correlation between the output of the establishment and its cost of production. The big factories are, on the whole, the low-cost factories. There are exceptions; some small factories show a low cost and some big factories a high cost, but the tendency is unmistakable. In the manufacturing stage, however, the cost of transporting

the cane or beets over long distances imposes an ultimate limit to the size of the sugar factory. The sugar factories, as noted above, must be near their raw material. No such limitation is imposed on the refineries. This fact, together with the cheapness of ocean transportation and nearness to the great centers of population, determines the centralization of the refining industry in enormous refineries along the Atlantic and Pacific seaboard.

II. CHARACTER OF THE LABOR

The character of the labor employed in the sugar industry introduces serious social problems. The sugar industry, for the most part, calls for labor of a manual sort exacting only a moderate degree of intelligence—in the cane fields, plowing, cultivating, cutting, and hauling; in the beet fields, in addition to the plowing, cultivating, and hauling, the operations of blocking, thinning, weeding, lifting and topping. Much of the labor in the beet fields is performed by women and children. In Louisiana the field operations are conducted by both white and colored labor, about 62 per cent white and 38 per cent colored.[1] Both white and colored labor is also used in the factories. In Hawaii the laborers are of various races and nationalities—Japanese, Chinese, Filipino, native Hawaiian, Portuguese, and others, the Japanese greatly predominating. In the beet-sugar industry, as stated above, the

[1] Chaffe, J. B., Sen. Com. Finance Hearings, 67th Cong., 2d sess., p. 2308, 1922.

beet growing is conducted by independent farmers, though it is often provided in the contract that the factory shall supply the labor. The laborers supplied are generally foreign—Mexicans, Poles, Germans, or Russians. The farmers contract with the laborers, generally by families, at so much per acre, furnishing them with shacks to live in during the season. The usual rate is $35 per acre for all processes. Family earnings vary greatly, ranging from less than $400 to over $2,500 for the entire season of six or seven months.

A report issued through the Children's Bureau of the Department of Labor, relating to "Child Labor and the Work of Mothers in the Beet Fields of Michigan" for the crop season of 1920, shows conditions which may be summarized as follows: Five hundred families were studied in which a child under sixteen or a mother of a child under six worked in the fields. Of the children between six and sixteen 67 per cent were found at work in the sugar-beet fields. One-fourth of these workers were less than ten years of age and only one-fifth had reached the age of fourteen.

Such family labor was secured by agents of sugar companies from Detroit, Chicago, Ohio cities, the mining districts of West Virginia, and even from Texas and Mexico. Among the laborers' families, 90 per cent of the mothers having children under six years of age worked in the fields and half the children under this age were usually taken by their parents to the field. The babies are sometimes kept in boxes or baskets without shelter of any

kind. Contract laborers are usually assigned as many acres on which to thin, hoe, and harvest the beets, at a fixed rate per acre, as they and their families together can take care of. Thinning is a process which must be done before the beet plants grow too large and, therefore, is usually performed under pressure. The family working day at this time was found to begin about six a.m. and to continue, with the shortest possible time for meals, until six, seven, and sometimes eight o'clock, or later, in the evening. Three-fourths of the children of school age had been absent from school on account of their work.

The sugar companies usually rented ancient farmhouses for their workers or furnished small portable houses, which were frequently crowded and sometimes in bad repair. In many of the beetfields, families of from three to ten persons were obliged to sleep in one small, ill-ventilated room. Occasionally, a shack of tar paper or tin, or a caravan wagon to be moved about as the work required, was the only shelter provided. One child told the agent, "The family has to take turns going in, as there isn't room for all of us at once."[1]

An important social problem is raised by the induction into American farming communities of the

[1] Child Labor and Working Methods in Beet Fields . . . of Michigan: U. S. Children's Bur. Publication 115, 1923. It is fair to say that the statement made by the Children's Bureau has been called in question. A committee appointed by the Michigan legislature made an investigation and submitted a report denying that conditions were as represented.—*See Journal of the House of Representatives* [*Michigan*], *session of 1923, pp. 1252–1254.*

type of labor and the agricultural methods which have been described as associated with the cultivation of the sugar beet. The heterogeneous population for which the sugar industry is responsible in the Hawaiian Islands is also not without its social significance.

In the factories the greater part of the labor is of the class entitled "semiskilled." It consists in watching and tending machinery, turning a cock, moving a lever, trucking, etc. The most skilled positions are those of sugar boiler and chemist. The sugar boiler's business is to watch the boiling down in the vacuum pan, to test the juice from time to time to see whether the crystals have begun to form, and to judge when to stop the operation. It is a position calling for experience and judgment.

III. BEARING ON THE TARIFF OF THE FACTS BROUGHT OUT IN CHAPTER I

The short season in Louisiana necessitates the harvesting of the cane before it is fully mature. The sugar yield per acre is therefore low [1] and the

[1] The average sugar yield per acre is, for Louisiana, 2,616 pounds; Hawaiian Islands, 10,992 pounds; Porto Rico, 4,539 pounds; Cuba, 4,912 pounds.—*The Cane Sugar Industry, U. S. Dept. Comm. Misc. Ser. 53, p. 26, 1917.* The above figures do not, apparently, make proper allowance for the fact that in the Hawaiian Islands cane is a two-year crop. That is, from a given tract of land, one crop of cane is cut every two years. In Louisiana, allowing for customary rotation, two crops of cane are cut every three years. Comparison made on this basis would show about 5,400 pounds of sugar per acre in the Hawaiian Islands to about 1,700 in Louisiana. On either basis it will be seen that the yield per acre in Louisiana is the lowest. The yield per acre, however, is not the only factor

cost of sugar production tends to be correspondingly high. A comparatively high rate of duty, therefore, is called for if Louisiana planters are to be protected. This disadvantage is partly offset by the fact that cultivation expenses are somewhat reduced by the short season, by a superior location with respect to markets, and also by the fact that an immature cane is rich in invert sugar, rendering it peculiarly suitable for the manufacture of sirup and molasses. The receipts from the sale of sirup and molasses by the sugar factories in Louisiana are larger proportionately than in any other important region of cane-sugar production.

Michigan and the other beet-sugar States east of the Mississippi River rely on natural rainfall. The sugar-beet crop, therefore, is less reliable than that of the more western States, which rely on irrigation. Hence, costs of producing sugar average higher, and a higher rate of duty is necessary if the producers in these States are to be protected. This disadvantage again is partly offset by the better location with respect to markets.

The fact that the industry is predominantly agricultural and that the lands appropriated for sugar production vary greatly in their adaptability to this purpose insures the continuance of great differences in the costs of producing sugar among individual

determining the agricultural cost of producing sugar. High yield per acre may be obtained only at the price of a heavy expenditure. The yield per acre in the Hawaiian Islands is more than double that in Cuba, but the agricultural cost of producing sugar in Cuba is less than in the Hawaiian Islands, where expenditure for fertilizers and irrigation is heavy.

establishments. Such differences in costs render the problem of adjusting tariff rates by the principle of "equalizing" costs indeterminate. (See Chapter V.) The agricultural character of the industry tends to make the reduction or removal of the duty a less serious matter. Because of the highly specialized character of the plant and machinery in the factory phase of the industry, such factories as could not survive a reduced tariff would be nearly a dead loss. But land has so many alternative uses and the labor employed in both field and factory is of such a simple semiskilled character that the abandonment of protection would not greatly derange either the agricultural or labor interests, except in Hawaii, which like Cuba has become a predominately one-crop country.

The cultivation of the sugar beet has a beneficial effect upon the soil and depletes it of no valuable mineral constituents. If protection is to be granted to agricultural industries at all, the beet-sugar industry has on this score a legitimate claim to consideration. On the other hand, the short season during which factories are in operation in Louisiana, and the short season and labor conditions in the beet-sugar industry, raise a question as to the wisdom of protecting an industry which necessitates the tying up of capital for so large a part of the year and which introduces such serious social problems.

The manner in which the industry is organized results in its segregation into powerful groups having conflicting tariff interests. On the one hand, the

seaboard refineries and the American investors in Cuban sugar properties desire the widest possible market for Cuban sugars, and hence their tariff interest is for a low duty or no duty. On the other hand, all the domestic producers, whether of cane or beet sugar and whether they represent the agricultural or the manufacturing stage, desire to reserve so far as possible the American market for domestic sugars, and hence their tariff interest is for a high duty.

Of all the regions mentioned, Cuba offers the best natural advantages for the production of sugar. It is, however, foreign territory. A tariff problem is therefore at once presented. The lower the rate of duty the more will the American people be able to avail themselves of the bounty of nature as displayed in Cuba in securing their sugar, but the more also will this be at the sacrifice of a part of the domestic industry. The higher the rate of duty the greater will be the proportion of the sugar supply derived from domestic sugars, but the more the American people will be deliberately foregoing nature's bounty in Cuba. Where to draw the line between the satisfaction that comes from the consciousness that one is consuming domestic sugar and the satisfaction that comes from the consciousness that one is consuming cheap sugar presents a tariff problem of the first magnitude.

CHAPTER II

GROWTH AND IMPORTANCE OF THE SUGAR INDUSTRY

Having discussed, in Chapter I, the general character of the industry, the regions in which it flourishes, the processes involved, its organization, and certain tariff and social problems that arise therefrom, it is appropriate next to describe its growth and present importance, especially in the United States (including the insular possessions) and in Cuba.

The chapter naturally divides itself into five sections: I. World-wide growth of the sugar industry. II. Growth of the domestic and Cuban cane-sugar industry. III. Growth of the domestic beet-sugar industry. IV. Capital and labor in the domestic and Cuban sugar industries. V. Bearing on the tariff of the facts brought out in Chapter II.

I. WORLD-WIDE GROWTH OF THE SUGAR INDUSTRY

Though now one of the most widely used and appreciated of foodstuffs, sugar was unknown in western Europe until comparatively recent times. It was unknown to the Greeks and Romans, who relied on honey for sweetening. The canes were first mentioned as "the sweet sticks of the East," and are supposed to have originated in India.

Sugar is mentioned as part of the spoils of the Byzantines when they conquered Persia in A.D. 627. It reached Spain in 755. About the middle of the fourteenth century the art of refining was discovered by a Venetian and soon afterwards a 50-ton cargo was exchanged for wool in London. Not until the middle of the sixteenth century, when it was introduced into the household of Queen Elizabeth, did it become an article of general human consumption.

From ~~such~~ small beginnings the industry has expanded to nearly every country in the world—cane sugar in the tropics and beet sugar in the temperate zone. India, the original seat of the industry, still remains one of the greatest sugar-producing countries, its production being exceeded only by that of Cuba. It, however, consumes all that it produces and imports considerable quantities in addition. / Other sources of cane sugar are, in order of importance (1922–23), Java, the United States (including its insular possessions), Brazil, Formosa and Japan, Peru, Australia, Mauritius, San Domingo, Argentina, the West Indies, Natal, Mexico, Demerara, Egypt, and about ten other tropical countries, whose annual output is less than 60,000 tons each. The most important source of beet sugar is Germany, followed by the United States and Czecho-Slovakia. Other sources, in order of importance (1922–23) are France, Belgium, Holland, Poland, Italy, Russia and Ukraine, Spain, Denmark, Hungary, Sweden, Roumania, Bulgaria, Austria, Canada, and Switzerland.

The beet-sugar industry is of much more recent origin even than the cane-sugar industry. Indeed, it was not known that sugar could be extracted from the beet until 1747, when Marggraf, a Prussian chemist, succeeded in obtaining a few crystals.[1] Frederick the Great and Frederick William of Prussia assisted Achard, a pupil of Marggraf, in continuing this line of research and in placing the manufacture of sugar from beet on a commercial basis. A small factory was erected at Cunern in Silesia. The impetus that led to the manufacture of beet sugar on a large scale, however, came from Napoleon, who in 1811 issued a decree appropriating 1,000,000 francs for the establishment of technical beet-sugar schools, requiring peasant farmers to plant 79,000 acres of land to sugar beets, and providing that after 1813 the importation of sugar into France should be prohibited.

The growth of the industry has been accompanied by important discoveries and inventions, resulting in improved economy and effectiveness at every stage. At the agricultural end, experiments have been directed to the improvement of the cane and beet in sugar content, to the use of fertilizers, and to the elimination of insect pests; and the results have shown that both the yield per acre and the sugar content can be greatly increased. In Hawaii, for example, where the greatest attention has been given to

[1] The presence of sugar in the beet was suspected at an earlier date. In 1605, Olivier de Serres, a French agronomist, obtained alcohol from the fermentation of beet juice and was thereby led to conclude that the beet contained sugar.

methods of cultivation and fertilization, the average yield of cane per acre has been increased to about 44 tons, while the yield in Porto Rico is 20.4 tons; in Louisiana, 18.3 tons; and in Cuba, 21.3 tons.[1] Yet natural conditions in Hawaii are certainly inferior to those of Cuba. The sugar content of the beet has been increased from an average of some 5 or 6 per cent at the beginning of the nineteenth century to as high as 20 per cent at the present time, the average for American factories being now over 15 per cent. In the manufacturing stage noteworthy improvements have been the so-called "multiple effect" and "vacuum pan," superseding the old "open-kettle" process and greatly economizing the heat required for boiling down; and the centrifugal machine for separating the sugar from the molasses and superseding the old process of draining in barrels the massecuite, as the mass of sugar crystals, molasses, and various impurities resulting from the boiling down of the juice is called. The old process is still practiced in some regions and the resulting sugar is known in the trade as "muscovado sugar."

At the refining end, mention should be made of the use of bone-black or animal charcoal as a filter, superseding the old claying process and the use of ox blood. Finally, in marketing the sugar and especially in testing it for duty assessment the polari-

[1] The Cane Sugar Industry: U. S. Dept. Comm. Misc. Ser. 53, p. 26, 1917. It must be remembered that in Hawaii cane is a two-year crop. The average *annual* yield per acre would therefore be 22 tons. In Louisiana, assuming two cane harvests every three years, the average *annual* yield per acre would be 12.2 tons.

scopic test has excelled all previous methods in accuracy, standardization, and the elimination of fraud.

II. GROWTH OF THE DOMESTIC AND CUBAN CANE-SUGAR INDUSTRIES

The United States is now one of the greatest sugar-producing and sugar-consuming countries in the world. In consumption it ranks first. In 1922 about 5,700,000 tons[1] (in terms of refined sugar) were consumed, of which 42.5 per cent was of domestic origin. This was about 29 per cent of the total world consumption for that year. In beet-sugar production the United States took second rank in the years 1920–21 and 1921–22, being exceeded only by Germany. In 1922–23 it fell to third place, being exceeded by Germany and Czecho-Slovakia. In cane-sugar production in 1921–22 it was exceeded only by Cuba, British India, and Java. In that year its total domestic output, both cane and beet, was 2,687,306 tons and was exceeded only by that of Cuba (4,475,953 tons) and British India (2,835,840 tons).

The above total of 2,687,306 tons was produced in widely scattered regions: cane sugar in Louisiana, 324,429 tons; Texas, 3,270 tons; Porto Rico, 405,935 tons; Hawaiian Islands, 548,800 tons; the Virgin Islands, 5,600 tons; and the Philippine Islands, 378,739 tons; and domestic beet sugar in about 16 States, 1,020,533 tons. (See Appendix G, p. 293.)

[1] The consumption fell off in 1923 to 5,350,000 tons.

A few words may be said as to the growth of the industry in each of these regions.

Louisiana and Texas.—The cultivation of the cane was introduced into Louisiana in 1751 by the Jesuits, but sugar was not successfully extracted until 40 years later. Since 1791 sugar has been continuously produced. Until 1882 the growing of the cane and its manufacture into sugar were conducted in a primitive manner in numerous small units. Since that time scientific methods have rapidly progressed with a tendency for the number of establishments to decrease and the size of each to increase. In 1880 there were 1,144 small sugar factories with an output of 121,886 tons, and in 1919 (census figures) 202 factories with an output of 225,498 tons. These figures apply to all cane sugar produced in the continental United States. A small quantity is produced in Texas—about 4,000 tons in 1918–19; none in 1919–20.

The great problem for the sugar industry in Louisiana has always been the climate. Any year an early frost, drought, or heavy rains may bring disaster. The precarious situation of the industry in this respect is shown by the great variability of the output, which ranged between 1912 and 1922 from 115,590 tons in 1919–20 to 302,899 tons in 1916–17. Production reached a maximum in 1904–05, with 398,194 tons. For the best results in sugar extraction, cane should not be harvested until it has had at least 12 months to grow and it may improve for several months longer. Immature cane is less rich in sucrose content and contains

much invert sugar. The problem in Louisiana would be partly solved by the development of a cane capable of standing a moderate frost, as often the first frost (which cuts down the cane) is followed by six to eight weeks of warm weather, during which a hardy cane might continue to mature and form sugar. Experiments are now being directed to the development of such a cane.

The output of sugar in Texas has always been small and is apparently decreasing. It has decreased from 9,000 tons in 1912–13 to 3,220 tons in 1922–23.

Hawaiian Islands.—Sugar cane was introduced into the Hawaiian Islands about 1837. The industry developed slowly; crude methods were employed, irrigation was unknown, and after twenty-three years (1860) only 722 tons of sugar and 2,600 barrels of molasses were exported.

From these small beginnings the industry has developed to one of first importance. In 1921 over 550,000 tons of sugar were produced, all of which, except a small amount retained for domestic consumption, was shipped to the United States. The value of the sugar produced represents about nine-tenths of the value of all the agricultural products of the islands; and the industry gives employment to about one-fifth of the entire population. Except for a considerable pineapple industry and some coffee, Hawaii is virtually a one-crop country.

This phenomenal growth of the sugar industry was greatly stimulated by the reciprocity treaty of 1876, by virtue of which sugar and certain other

products of Hawaii were admitted to the United States free of duty in return for reciprocal concessions. This remission of duty brought little or no benefit to the American consumer of sugar.[1] Dutiable sugar continued to be imported in large quantities and the price of duty-paid sugar determined the price of all domestic sugars and of Hawaiian sugar. The remission of duty simply resulted in a bonus of about 2 cents per pound (the previous duty) to the Hawaiian producers. Such a bonus greatly stimulated their industry. Shipments increased from 13,000 tons in 1876, the year in which the treaty went into effect, to 130,000 tons in 1890, the year in which the McKinley Tariff Act was enacted.

The large commitment of capital brought about by this stimulus to the sugar industry had an important bearing on the subsequent history of the islands. The McKinley Tariff Act, just referred to, put sugar on the free list and provided for a bounty of 2 cents per pound to domestic producers. The Hawaiians, not being domestic producers, received no bounty, nor did the reciprocity treaty now accord them any preference. They were simply on a parity with all other foreign producers. While the remis-

[1] It is perhaps too much to say that the remission of the duty on Hawaiian sugar resulted in *no* benefit to the American consumer. The effect of a remission of duty upon a part of the imports is more fully explained in Chapter V (pp. 119–122). A parallel case occurred some years later when Cuba was given a preferential rate. At first the benefit of the reduction went almost exclusively to the Cuban producer, but after the lapse of years it was largely transferred to the American consumer.

sion of duty merely to one country could not greatly reduce the price so long as large importations of duty-paying sugar continued, a general remission of duty did have a tendency to reduce the price and hence deprive the Hawaiians of the bonus which they had been enjoying. This situation and the fact that the Hawaiian sugar industry was largely controlled by American capitalists gave an impetus to the movement for closer political relations with the United States, which culminated in the annexation of the islands in 1898.

Since annexation the sugar industry has continued to flourish. Indeed, production increased even during the lean years of the McKinley Tariff, though not so rapidly as during the years that followed the adoption of the Act of 1894, when the policy of levying a duty on sugar was resumed.

Among the most noteworthy characteristics of the sugar industry in Hawaii have been the installation of huge irrigation projects and the intensive cultivation of the cane. Daring engineering feats involving storage reservoirs, ditches, canals, and tunnels have been accomplished. The peculiar situation calling for such constructions lies in the fact that the high mountains on each of the islands precipitate the moisture brought by the trade winds so that it falls in quantities adequate for the cultivation of the cane only on the windward side, while much of the land most suitable for cane growing lies on the leeward side. It is, therefore, necessary to convey water from the windward to the leeward side of the islands. The land, much of it not naturally dis-

tinguished for its fertility, has been brought by the use of heavy farming machinery and great expenditure for commercial fertilizers to a point where the yield per acre exceeds that of all other regions. (But see footnote, pp. 27, 34.)

The growth of the sugar industry has developed in the Hawaiian Islands a heterogeneous population. The native Hawaiians did not adapt themselves readily to the monotonous routine labor of modern industry. Their numbers have rapidly declined from a total of 70,036 in 1853 to 24,120 in 1915, or, if we include part Hawaiians, from 71,019 to 38,920. This has resulted in the influx of various races and in the creation of a labor problem for the sugar industry that is still acute. In 1915 the total population was made up as follows: Hawaiian, 24,120; part Hawaiian, 14,800; Chinese, 21,770; Japanese, 93,136; Filipinos, 15,220; Portuguese, 23,560; other Caucasian, 25,290; all other, 5,270; army and navy, 9,600. The population engaged in the sugar industry alone in 1914 was: American, 625; Hawaiian, 965; Porto Rican, 1,439; Portuguese, 3,570; Spanish, 1,715; Russian, 73; Filipinos, 9,000; Japanese, 24,340; Chinese, 2,264; Koreans, 1,417; all other, 310; total, 45,718.[1]

Partly, perhaps, because of the ever-present labor problem, the Hawaiian planters have developed methods of cooperation in disseminating among themselves information relating to scientific and mechanical improvements for the advancement of

[1] The Cane Sugar Industry: U. S. Dept. Comm. Misc. Ser. 53, p. 219, 1917.

the industry and the reduction of the cost of production. An experiment station was organized in 1894, where men of the highest attainments have conducted experiments for developing new varieties of cane, testing fertilizers, controlling pests, improving processes of manufacture, and giving attention to other matters which might conduce to economy in the production of sugar.

Porto Rico.—The sugar industry in Porto Rico may be said to date from 1515, when sugar cane was introduced from the neighboring island of Santo Domingo, though it was not until 1530 that mills were established with their surrounding plantations for manufacturing molasses. Not until 1548 was sugar manufactured.

Under the encouragement of the Spanish government, which made loans to planters, the industry gradually developed, though with very primitive methods. Until the American occupation in 1899: "The cane was ground in small mills, the machinery consisting principally of wooden single and double roll crushers driven by bullock power, open kettles for boiling, wooden vats for crystallizing out the second sugar, and dripping rooms in which the hogsheads of crude sugar were drained of their surplus molasses." [1] Labor was performed by slaves until slavery was abolished. Since becoming United States territory, production has been greatly stimulated, having risen from about 60,000 tons in 1897 to about 450,000 tons at the present time. In 1900 an agricultural experiment station was established

[1] Ibid., p. 248.

under the supervision of the United States Department of Agriculture. From the station are issued circulars and bulletins dealing with the proper cultivation of cane, treatment of soils, proper fertilizing, eradication of insect pests, etc. An irrigation project for supplying water to the dry southern coastal region of the island has also been put into effect. Moreover, since the American occupation "old methods of manufacture have been discarded, new and improved machinery installed, and railroads for the transportation of cane have been built." [1]

The cane is produced either on estates owned by the companies by their own laborers or by the "colono system." There are several classes of colonos: (1) those who produce cane on their own land and finance cultivation expenses themselves; (2) those who produce cane on their own lands but are financed by the "centrals," as sugar factories in Porto Rico and Cuba are termed; (3) those who rent land and either finance their crops or are financed by the central; (4) those to whom land is furnished by the central, either free of charge or at a nominal rental. Some of the colonos who cultivate "central" land own farming implements and animals, but more frequently the central furnishes the seed, fertilizer, agricultural implements, etc., the colono furnishing only the labor. Centrals usually contract with the colonos to plant a certain number of acres in cane for a term of years. Payments are made in cash in terms of sugar.[2] (See pp. 139–140.)

[1] Ibid., p. 249.
[2] Ibid., p. 252.

Philippine Islands.—The production of sugar was introduced into the Philippine Islands at an early date, probably by the Chinese from Formosa. No record is extant; but evidence may be drawn from the fact that the implements used for crushing the cane, including heavy stone rolls mounted on vertical axles, were the same as those used by the Chinese elsewhere. When Magellan discovered the islands in 1521, he found the natives already producing sugar on a small scale by the crude Chinese methods. The industry gradually grew. By 1795, 296,219 pounds of sugar were exported to the United States. By 1854 the total production was about 40,000 tons.

The Philippine Islands have been slow to change from the crude open-kettle process formerly prevailing throughout the world. Many old native factories still operate; and a large part of the output is still "muscovado" sugar. The cane is cut with a "bolo" or cutlass, hauled to the factory on crude wooden frames without wheels by "carabaos" or water buffaloes, and crushed between stone rolls. The juice, treated with air-slaked lime, is boiled down in kettles over an open fire and when boiled to the point of crystallization is left in bell-shaped earthen jars, known as "pilons," to cool and drain off the molasses, or is placed in wide shallow boxes and stirred until it becomes crystallized. Since the beginning of the present century, however, modern factories have been erected for producing centrifugal sugar and are gradually superseding the primitive methods. By 1914, 15 such factories were in operation. More than 400,000 acres of land are now

devoted to sugar cane, and the acreage of land still available is at least equal to that now planted to cane. With the progress of modern methods and the increase in acreage, there is, therefore, the prospect of a very considerable increase in the output of sugar from the Philippine Islands.

The Philippine Islands constitute the only region contributing any considerable amount of sugar to the United States from which the Tariff Commission has not collected cost data. However, the fact that a considerable portion of the annual output is shipped to other countries than the United States indicates that the cost of production must be low. Philippine sugar is admitted free to the United States and therefore, like Hawaiian and Porto Rico sugar, can command, after allowing for transportation differentials, an "f.o.b. mill" price higher by the amount of the duty than that of foreign sugars, when sold in the American market. But when sold in other markets it competes on equal terms. The fact that it is able year after year to meet such competition from all sources indicates that its cost of production is low. (See Appendix G, p. 293.)

Virgin Islands.—St. Croix, St. Thomas, and St. John, which constitute the Virgin Islands, were acquired by the United States from Denmark in 1917. They furnish a small portion of the sugar consumed in the United States, the total output of the islands in 1921–22 being 5,000 tons. Because of their small area, altogether about 132 square miles, their contribution must always remain inconsiderable.

Cuba.—Sugars from all the regions specified above may be moved between any two points in United States territory without payment of duty, and hence in a tariff discussion may be treated as domestic sugars. The only foreign region that needs to be considered in this connection is Cuba. Because of the Cuban preferential rate allowed by the United States on Cuban imports, the quantity of sugar received from other sources may be regarded as negligible. Such problems of protection as the sugar industry presents have reference to the competition between domestic and Cuban producers. Hence, in connection with the growth and importance of the domestic industry, a few words should be said about the growth and importance of the sugar industry of Cuba.

The sugar industry in Cuba dates back to the early years of the sixteenth century. In its early history it was developed by slave labor. In 1713 England formally agreed to furnish Spain with 144,000 negroes, delivering them in her Antillean colonies; and most of these were used in the sugar industry.[1] Slavery was abolished in 1878; and the cultivation of the cane by slave labor under the direct management of the factories or "centrals" gave place to an independent colono system similar to that of Porto Rico.

Sugar production increased rapidly after 1878. It received a temporary setback from the revolution of 1896 but forged ahead after Cuban independence

[1] The Cane Sugar Industry: U. S. Dept. Comm. Misc. Ser. 53, p. 354, 1917.

was secured in 1898. In that year the output was 347,000 tons. In 1903 a reciprocity treaty was negotiated granting Cuba a preferential tariff rate, 20 per cent less than the full duty, on all Cuban products exported to the United States. As with the Hawaiian reciprocity treaty, this concession—so long as full-duty sugars continued to be imported in considerable quantities—operated rather as a bonus to Cuban producers than as a benefit to American consumers and therefore greatly stimulated production in Cuba. By 1914, at the outbreak of the World War, the Cuban output had reached about 2,900,000 tons. American investment in the Cuban sugar industry began before the war, but after 1914 it increased at an unprecedented rate. By 1921, of the total output of nearly 4,500,000 tons 53 per cent was from establishments under direct American control.

A significant feature of the recent development of the Cuban sugar industry is that it has taken place in the eastern part of the island. While there is still excellent land in the western portion, the long period of cultivation has somewhat diminished its fertility. The eastern portion is virgin land and until recently has been jungle. It requires considerable initial investment to fit this land for cultivation, but once the investment has been made the land is extremely fertile and yields large crops at a low cost. It is to the eastern portion of the island that the recent heavy American investment has been chiefly directed. Cuba now leads the world in sugar production and is capable of greatly increasing its output for many years to come.

III. GROWTH OF THE DOMESTIC BEET-SUGAR INDUSTRY

In 1838 Edward Lee Church, with the aid of one Isnard, who had assisted Napoleon in introducing beet-sugar manufacture into France, established a beet-sugar manufactory in Northampton, Mass. This was the first beet-sugar factory in America. The experiment was not financially successful and was followed by several other attempts which were also unsuccessful. It was not until 1870, when E. H. Dyer erected a beet-sugar factory at Alvarado, Calif., that the business of extracting sugar from the beet was made a financial success. Since that time the industry has grown; and, in 1921, 23 per cent of our entire domestic consumption of sugar was derived from beets grown in the United States. In 1922, however, there was a decided falling off.

The government has encouraged the beet-sugar industry. The domestic beet-sugar industry, like the domestic cane-sugar industry, has always received from the government the indirect encouragement of a protective tariff. The beet-sugar industry has, in addition, received much direct government encouragement both National and State. As early as 1879 Dr. William McMurtrie, chemist, United States Department of Agriculture, mapped out a theoretical beet-sugar area in the eastern portion of the United States. This work was continued and enlarged by Dr. Harvey W. Wiley, chief of the Bureau of Chemistry of the Department of Agriculture. Under his supervision experiments were conducted for five years by thousands of farmers in

various localities; beets were shipped and analyzed, and from results obtained a map was constructed showing the theoretical beet-sugar area of the United States. He also succeeded in producing high-grade sugar-beet seed in Nebraska and for thirty years advocated the culture of sugar beets. James Wilson, who was Secretary of Agriculture from 1897 to 1913, was influential in enlisting the interest of capitalists in the beet-sugar industry. In the sixteen years during which he was Secretary, $80,000,000 was invested in the erection of 76 beet-sugar factories.[1] Legislation granting bounties to the sugar industry was adopted in Idaho, Kansas, Minnesota,[2] Michigan,[2] Nebraska, and New York; and for several years Iowa exempted the property of sugar manufacturers from taxation. These bounties and exemptions were all for brief periods; none of them is now in force.[3]

The beet-sugar industry flourishes to a greater or less extent in no less than 16 States, but in several of them is of minor importance. For the purpose of tariff discussion the industry may better be segregated by regions than by States—the Pacific region, comprising California and Washington; the mountain region, comprising Colorado, Utah, Idaho, Montana, Nevada, and Wyoming; and the eastern region, comprising Michigan, Ohio, Wisconsin, Minnesota, Iowa, Indiana, Illinois, and Nebraska.

[1] Concerning Sugar, C 16, 1922.

[2] Declared unconstitutional.

[3] Report on the Beet-Sugar Industry in the United States: Federal Trade Commission, p. 14, 1917.

The industry, as will be shown later, is unequally dependent upon the tariff in these regions. Costs of production are higher in the eastern than in either the mountain or Pacific region; and hence a rate of duty sufficient for the two last might not be sufficient for the eastern.

IV. CAPITAL AND LABOR IN THE DOMESTIC AND CUBAN SUGAR INDUSTRIES

The capital investment in the domestic industry is nearly $1,000,000,000. Of this amount more than three-fourths represents the investment of the domestic producers in the beet-sugar industry in the continental United States and in the cane-sugar industry in Louisiana and Texas, in Porto Rico, and in the Hawaiian, Philippine, and Virgin Islands. The remainder represents the investment in the seaboard refineries. About three-fourths of a billion dollars of American capital is invested in the Cuban sugar industry. The domestic producers in the United States employ about 278,000 laborers, and the seaboard refiners about 21,000. The estimates by regions and the sources on which these estimates are based are as follows:

Census figures (1919) account for nearly half a billion dollars invested and 42,000 persons employed in sugar factories and refineries in the Continental United States. The most authoritative figures relating to investment and labor in the domestic sugar industry are those of the United States Census, though even these figures must be accepted only as

an approximation. From them it appears that for the year 1919 the refineries showed a capital investment of about $193,000,000 in 20 establishments, giving employment to about 21,000 persons and turning out products to the value of about $731,000,000; the beet-sugar factories showed a capital investment of about $225,000,000 in 85 establishments, giving employment to about 14,000 persons and turning out products to the value of about $149,000,000; and the cane-sugar factories (practically all in Louisiana and Texas) showed a capital investment of about $55,000,000 in 202 establishments, giving employment to about 7,000 persons and turning out products to the value of about $58,000,000. The census figures are reproduced in full in Table II.

The figures of the census apply only to the manufacturing and refining branches of the industry in the continental United States. They do not include data for the agricultural end of the industry in the continental United States, nor any data whatever for the insular dependencies. They are, however, the best now available so far as they go. The following figures covering the manufacturing and agricultural phases of the industry in all regions of domestic production are more comprehensive, but most of them are only rough estimates. The Tariff Commission is now collecting data which, when available, will afford much more reliable figures.

Louisiana and Texas account for $142,000,000 capital and 55,000 persons. The following is an

TABLE II.—STATUS OF THE MANUFACTURING AND REFINING BRANCHES OF THE SUGAR INDUSTRY IN THE CONTINENTAL UNITED STATES FOR ITEMS AND YEARS SPECIFIED *

Item	Total		Beet sugar		Cane sugar		Sugar refining	
	1919	1914	1919	1914	1919	1914	1919	1914
Number of establishments	307	259	85	60	202	181	20	18
Persons engaged	42,156	26,739	14,190	9,634	7,045	4,544	20,921	12,561
Proprietors and firm members	172	181	1	1	165	172	6	8
Salaried employees	5,900	3,676	2,408	1,636	779	740	2,715	1,300
Wage earners	36,084	22,882	11,781	7,997	6,101	3,632	18,202	11,253
Primary horsepower	281,796	239,617	127,394	76,705	101,861	113,246	52,541	49,666
Capital	$473,242,631	$315,677,669	$224,584,679	$142,181,326	$55,117,127	$32,996,524	$193,540,825	$140,499,819
Salaries and wages	54,163,542	21,242,971	20,336,074	8,864,853	5,674,817	2,052,521	28,152,651	10,325,597
Salaries	11,535,591	5,252,014	4,427,956	2,258,649	1,665,448	491,145	5,442,187	2,502,220
Wages	42,627,951	15,990,957	15,908,118	6,606,204	4,009,369	1,561,376	22,710,464	7,823,377
Paid for contract work	891,660	279,915	796,772	247,657	27,366	11,988	67,522	20,270
Rent and taxes	19,154,128	2,014,111	11,450,299	807,223	1,142,247	263,820	6,561,582	943,068
Cost of materials	793,316,541	321,442,937	87,029,144	41,399,361	44,143,416	15,958,218	662,143,981	264,085,358
Value of products [a]	937,883,918	373,639,298	149,155,892	62,605,210	57,741,320	21,635,373	730,986,706	289,398,715
Value added by manufacture	144,567,377	52,196,361	62,126,748	21,205,849	13,597,904	5,677,155	68,842,725	25,313,357
Sugar:								
Tons (2,000 lbs.)	4,468,860	4,341,408	721,909	743,473	225,498	264,801	3,521,453	3,333,134
Value	$888,326,173	$363,034,123	$138,099,693	$58,590,466	$36,659,085	$18,947,683	$713,567,395	$285,495,974

* Sugar Industry: Fourteenth Census, vol. 10, p. 133, 1923.

[a] Includes molasses, sirup, pulp, etc., and is of course considerably greater than the value of sugar alone (shown in the last line).

estimate of the magnitude of investment in the Louisiana sugar industry made by Joe B. Chaffe:[1]

600,000 acres under plow at $125 per acre.	$75,000,000
189 sugar factories (1914 census report).	33,000,000
Railroad equipment	3,500,000
48,000 mules at $150	7,200,000
Implements, wagons, harness	1,300,000
Total	$120,000,000

On the basis of 80 men to 1,000 acres and the 7,000 persons in the factories the total number of employees in the sugar industry would be 55,000.

Mr. Chaffe bases his estimate of the value of the sugar factories on the census of 1914. The 1919 figures, which have appeared since the estimate was made, are 202 factories valued at $55,000,000. Accepting the other items and making allowance for the increased value of the factories, Mr. Chaffe's estimate would become $142,000,000.

The beet-sugar industry in the continental United States accounts for $305,000,000 capital and 74,000 persons. As shown in Table II, the census figures for 1919 place the value of the beet-sugar factories at $225,000,000. The United States Department of Agriculture places the acreage planted to beets in 1922 at 606,000 acres.[2] In the Monthly Crop Reporter for March, 1920, is given the average value of "good plow lands" in the several states of the Union. On the basis of this estimate the total value

[1] Chaffe, J. B., Sen. Com. Finance Hearings, 67th Cong., 2d sess., p. 2308, 1922.

[2] Weekly Statistical Sugar Trade Journal, p. 553, Nov. 16, 1922.

of the lands devoted to the cultivation of sugar beets would be $70,540,000.[1] It is believed that this estimate is conservative, as it is generally estimated that the value of beet lands averages considerably above that of the "good plow lands" of the Monthly Crop Reporter. Some would increase the above estimate by as much as 50 per cent. Moreover, the acreage devoted to the cultivation of the sugar beet in 1922 was considerably less than that of preceding years. The acreage for 1921 was 882,400, and for the years 1916–20 the average was 826,700. Exceptional conditions caused the small acreage of 1922. A substantial increase is predicted for 1923.[2] A conservative estimate of the value of animals, tools, machinery, and buildings invested in

[1] The figures on which the above estimate is based are as follows:

ESTIMATED VALUE OF BEET LANDS IN THE UNITED STATES

State	"Good plow lands" per acre	Acreage, 1922	Total value
Ohio	$132	31,400	$ 4,093,000
Michigan	80	95,400	7,632,000
Wisconsin	125	17,800	2,225,000
Nebraska	150	54,000	8,100,000
Colorado	88	165,200	14,539,000
Utah	135	79,900	10,793,000
Idaho	135	33,200	4,481,000
California	175	62,200	10,886,000
		539,100	$62,749,000

$62,749,000 multiplied by the ratio of 606,000 acres to 539,100 = $70,540,000.

[2] An estimate by the Department of Agriculture places the acreage at 651,000.

the production of sugar beets would be $10,000,000. The number of persons engaged in producing sugar beets may be estimated at 60,000. Table II shows the number of persons engaged in the manufacture of beet sugar to be 14,189. Hence the total number of persons engaged in the beet-sugar industry is not less than 74,189.

The Hawaiian Islands account for $154,000,000 and 42,000 persons. Figures furnished by Royal D. Mead, representing the Hawaiian interests in Washington, show the total investment in the sugar industry in Hawaii to be $153,796,823 and the total number of laborers employed 42,333. On the basis of the apportionment in Louisiana between factory and agricultural labor, 36,935 would be agricultural laborers and 5,388 factory laborers. Figures furnished by the United States Tariff Commission show that, of the total investment, about 15.6 per cent is factory investment and 84.4 per cent is plantation investment. Hence the factory investment in the Hawaiian Islands may be estimated at about $24,000,000 and the plantation investment at about $130,000,000.

Porto Rico accounts for $60,000,000 capital and 87,000 persons. In his brief submitted to the Senate Committee on Finance in 1922, Henry A. Rubino, representing the American Sugar interests in Cuba, estimated the total value of the sugar properties in Porto Rico at $60,000,000.[1] On the basis of the ratio of factory to plantation investment

[1] Rubino, H. A., Sen. Com. Finance Hearings, 67th Cong., 2d sess., p. 2196, 1922.

given in "The Cane Sugar Industry," [1] the factory investment may be assumed to be $27,400,000 and plantation and other investment $32,600,000.

In the same report [2] the total number of persons employed in the sugar industry is given as 87,643, of whom 3,491 were in the factories and the remainder, 84,152, in agricultural operations.

The Philippine and Virgin Islands account for $72,200,000 capital and 20,000 persons. Mr. Rubino's estimate of the total investment for the Philippine Islands is $71,200,000. Applying to the Philippine Islands the ratios for factory investment, plantation investment, and number of laborers that were used in the Hawaiian Islands, the factory investment would be $11,100,000, the plantation investment $60,100,000, and the number of laborers 18,540, of whom 2,485 would be factory laborers and 16,055 plantation laborers. (See Appendix G, p. 293.)

On the basis of a general similarity of conditions between the Virgin Islands and Porto Rico, the factory investment in the Virgin Islands may be estimated at $518,000, the plantation investment at $511,000, the number of factory laborers at 60, and the number of plantation laborers at 1,400.

Cuba.—In his brief submitted to the Senate Committee on Finance in 1922, Henry A. Rubino, representing the American sugar interests in Cuba, included the following estimate:[3]

[1] The Cane Sugar Industry: U. S. Dept. Comm. Misc. Ser. 53, p. 285, 1917.

[2] Idem, p. 246.

[3] Rubino, H. A., ibid.

Sugar mills and estates owned by Americans	$ 621,219,766
Sugar estates controlled by Americans by reason of their being financed by Americans	125,000,000
American investments in Cuba dependent entirely upon the sugar business	156,250,000
Amounts due Americans for machinery, merchandise, and supplies, secured in part by equipment trusts, etc	128,600,000
Total	$1,031,069,766

Mr. Rubino's estimate includes both plantation and factory investment, between which, so far as tariff questions are concerned, a distinction may be drawn. Moreover, he includes, in his Cuban total of $1,031,069,766, investments by Americans who are more or less directly associated with the sugar industry in Cuba but who are not direct owners. Undoubtedly many such investments are associated with the domestic industry, perhaps relatively as many and as great as in the Cuban industry. The magnitude of such investments, however, is unknown, and hence they will not be included in the comparison made in this study. The first two items, amounting to $746,219,766, may be fairly used in the comparison as representing direct investment of American capital in Cuba.

Estimates Tabulated.—The foregoing estimates are shown in Table III (p. 57).

TABLE III.—Investment and Number of Laborers in the Sugar Industry in the Several Regions of Domestic Production

Investment	Beet-sugar industry		Louisiana and Texas		Hawaiian Islands		Porto Rico		Philippine and Virgin Islands		Totals	
	Million dollars	*Per cent total*	*Million dollars*	*Per cent total*	*Million dollars*	*Per cent total*	*Million dollars*	*Per cent total*	*Million dollars*	*Per cent total*	*Million dollars*	*Per cent total*
Agricultural....	80	10.9	87	11.8	130	17.7	33	4.5	60.6	8.3	390.6	53.2
Factory.....	225	30.7	55	7.5	24	3.3	27	3.7	11.6	1.6	342.6	46.8
Total.....	305	41.6	142	19.3	154	21.0	60	8.2	72.2	9.9	733.2	100.0
Number of laborers	*Number*	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*
Agricultural..	60,000	21.5	48,000	17.2	36,945	13.2	84,152	30.2	17,455	6.2	246,552	88.3
Factory.....	14,189	5.1	7,000	2.5	5,388	1.9	3,491	1.3	2,545	0.9	32,613	11.7
Total....	74,189	26.6	55,000	19.7	42,333	15.1	87,643	31.5	20,000	7.1	279,165	100.0

V. BEARING ON THE TARIFF OF THE FACTS BROUGHT OUT IN CHAPTER II

The progress of discovery and invention and the opening of new fields to cultivation tend to obscure the effect of tariff changes. Other things being equal, an increase in the rate of duty should normally be followed by an increase in price. But steady progress in the directions just referred to tends to lower the cost of production and hence ultimately to lower the price. As will be shown in Chapter VI, there had been for the 30 years preceding the war a general downward trend in real prices (see p. 158), even in years following an increase in the rate of duty. Advocates of protection sometimes point to this circumstance as evidence that an increase in duty does not increase the price. The point to be made here is that it *tends* to increase the price but that the tendency may be overcome by improvements in processes and the opening of new fields.

The crude methods of production referred to as still prevailing in the Philippine Islands suggest the possibility of a considerable increase in output from this region as they give way to more modern methods and an improved organization. Sugar is admitted free of duty from the Philippine Islands, and hence an increasing supply from this source will tend to neutralize any effect upon price which would normally be brought about by an increase in the duty on foreign sugar.

This chapter shows that the sugar industry has

grown to large proportions both in Cuba and in United States territory. How important are the interests concerned in the domestic industry may be judged from the estimate given in Table III. The American interests in Cuba and the refining interests are hardly less important. The domestic producers are to a considerable extent dependent upon the tariff and are benefited in proportion as the duty is high, while the Cuban and refining interests suffer from any increase in duty. For them the lower the duty the better. Some of the refiners, however, have "hedged." Under the Havemeyer management it became the policy of the American Sugar Refining Company to acquire an interest in the domestic beet-sugar industry. By this policy, if a high duty were imposed on sugar it would stand to gain on its beet-sugar holdings; while should the duty be lowered or removed it would be benefited in its refining business. In its annual report for 1920 the American Sugar Refining Company lists holdings of shares in beet-sugar companies to a total value of $16,461,900, or 7.3 per cent of the total investment in the beet-sugar industry.

The existence of these great conflicting interests is an argument for caution before making radical changes in the sugar tariff. Inconsiderate action either in raising or lowering the rate is likely to have far-reaching effects.

In estimating the injury that would be brought upon producers by violent changes in the rate of duty, a distinction should be drawn between the agricultural and manufacturing phases of the indus-

try. Much of the plant and machinery of the factories is of the nature of fixed capital. It must be used for the manufacture of sugar or not at all. Were the factories obliged to discontinue operations the capital invested in them would be practically a complete loss. The land, however, and much of the agricultural equipment would be as serviceable for other crops as for sugar. This is particularly true of beet lands. Indeed, even under existing conditions, the beet-sugar factories have some difficulty in inducing the farmers to grow beets, indicating that in the estimation of the farmers themselves other crops are at least as profitable. The transition from cane growing to other crops would be more difficult. Substitute crops are a serious problem on much of the Louisiana land; and any sudden abandonment of cane growing in such approximately "one-crop" countries as Cuba and the Hawaiian Islands, where the whole economic life of the people centers around the sugar industry, would be little short of disastrous.

In regard to labor, practically none of it at the agricultural end and very little of it at the manufacturing end is so highly specialized as to be seriously affected by the abandonment of the industry. Indeed, labor in the beet fields, seasonal in character, recruited and shipped from distant regions, and involving the employment of mothers and small children is such as to raise serious question as to the social value of the industry which fosters it.

CHAPTER III

PRODUCTION, CONSUMPTION, IMPORTS, EXPORTS, AND REVENUE *

In this chapter is presented a mass of significant statistical data relating to sugar. The material covers: I. World production. II. Domestic consumption. III. Domestic and Cuban production. IV. Imports. V. Exports. VI. Revenue yielded to the United States.

I. WORLD PRODUCTION

The annual world production of sugar at the outbreak of the war had reached a total of 20,648,855 tons, of which 10,977,720 tons, or 53.2 per cent, were cane sugar, and 9,671,135 tons, or 46.8 per cent, were beet sugar.[1] The war greatly reduced this total, the low ebb being reached in 1919–20. In that year only 17,024,449 tons were produced, of which 13,373,943 tons, or 78.6 per cent, were cane sugar, and 3,650,506 tons, or 21.4 per cent, were beet sugar.[2] Thus the cane-sugar production increased; but the increase was more than offset by the falling off in beet-sugar production, the net result being a decrease

* The "ton" in this *study* is the short ton of 2,000 pounds.

[1] Weekly Statistical Sugar Trade Journal, p. 19, Jan. 11, 1923. (Figures reduced to tons of 2,000 pounds.)

[2] Idem.

of 3,624,406 tons in the total world output. From being nearly one-half of the total, beet-sugar production fell to only about one-fifth.

The great falling off in beet-sugar production was due to the fact that Europe, the focus of the World War, was also the center of the beet-sugar industry. In 1913–14 Germany produced 2,932,089 tons. By 1919–20 her production had fallen to 828,294 tons. A similar comparison for Austria-Hungary shows 1,884,599 tons in 1913–14 as against 566,644 tons in 1919–20 (Austria, Hungary, Czecho-Slovakia); for Russia, 1,890,335 tons as against 244,498 tons (Russia and Ukraine); for France, 803,488 tons as against 172,977 tons.[1]

Since 1919–20 the world output has steadily increased, the production for 1922–23 being estimated at 20,206,407 tons, of which 14,404,473 tons, or 71.3 per cent, are cane sugar, and 5,801,934 tons, or 28.2 per cent, are beet sugar.[2] It will be seen that cane-sugar production remains considerably above the pre-war level, and that beet-sugar production is rapidly improving but has not yet recovered sufficiently to bring the total up to the pre-war level.

The falling off in beet-sugar production stimulated the production of cane sugar, especially in Cuba. Cuba produced 2,909,460 tons in 1913–14, 4,177,686 tons in 1919–20, an increase of about 44 per cent; and 4,475,953 tons in 1921–22, an increase above the pre-war level of about 54 per cent. Even before

[1] Weekly Statistical Sugar Trade Journal, p. 19, Jan. 11, 1923. (Figures reduced to tons of 2,000 pounds.)

[2] Idem.

the war, production in Cuba was increasing rapidly, stimulated by the reciprocity treaty of 1903 and the consequent heavy investment of American capital in the Cuban sugar industry. Production increased from 1,302,849 tons in 1904–05 to 2,909,460 tons in 1913–14, or 123.3 per cent. Of the total Cuban output in 1921, it is estimated that 53 per cent came from centrals controlled by American capital. (For table showing world production since 1913, see Appendix B.)

The peculiar relation in which Cuba stands to the United States as a result of the Spanish War, the treaty of 1903, and the investment of American capital in her chief industry have an important bearing on the tariff problem. (See pp. 219–220.)

II. DOMESTIC CONSUMPTION

The absolute and per capita consumption of sugar in the United States has increased rapidly during the last fifty years. Of the total world production the United States in 1922 consumed about 29 per cent. The proportion has not changed much in the last fifty years. It averaged 20.6 per cent for the five-year period 1865–69, reached 27.9 per cent in the period 1890–94, but had again fallen to about its former level (20.8 per cent) by the period 1910–14, and is now increasing. During the same half century, however, the absolute increase in United States consumption has been very great. From an annual consumption of about 500,000 tons at the close of the Civil War, the increase has been rapid

and continuous to the present time; for the year 1922 it is estimated at 5,703,889 tons, an elevenfold increase. This great increase in consumption is, of course, due in part to the increase of population, but it is also due—and this is more significant—to a growing reliance on sugar as an article of diet. In the period just referred to, the per capita consumption in the United States increased from 18.2 to 103.2 pounds.[1] This increase in sugar consumption is not confined to the United States; to a greater or less extent it is world-wide. Nor does it appear to have reached its limit; on the contrary, present indications are that for many years a strong and growing demand will maintain a price which will stimulate domestic industry and still permit large importations from Cuba, even over a considerable tariff.

The United States supply of sugar is derived in about equal proportions from domestic sources and from Cuba. Our present sugar consumption of about 5,400,000 tons is derived from foreign and domestic sources in about equal proportions. The only important foreign source of sugar is Cuba. Formerly we imported sugar in large quantities not only from Cuba but also from Java, from Germany, and from other countries. But the preferential rate given to Cuba by the treaty of 1903 was sufficient virtually to shut out sugars coming from other foreign sources, except in so far as they might be imported for refining and reexported with benefit of

[1] The consumption fell off in 1923 to 5,354,366 tons, or 95.6 pounds per capita.

drawback. (See footnote, p. 78.) As stated, the domestic sources are, for cane sugar, Louisiana and Texas, Hawaii, Porto Rico, the Philippine Islands, and the Virgin Islands; and for beet sugar, some 16 States, the most important of which are Michigan, Colorado, Utah, Idaho, and California. Table IV shows for recent years the contributions of all regions, foreign and domestic, towards the total consumption. (See Appendix G, p. 293.)

TABLE IV.—Sources and Quantities of Sugar Consumed in the United States for Years 1921, 1922, and 1923, in Terms of Refined Sugar *

Regions	1923		1922		1921	
	Tons	Per cent	Tons	Per cent	Tons	Per cent
Louisiana and Texas	241,475	4.5	305,728	5.4	305,506	6.6
United States, beet	985,520	18.4	1,005,344	17.6	1,060,614	23.1
Hawaii	515,031	9.6	516,869	9.1	540,201	11.7
Virgin Islands	1,578	.....	5,304	0.1	5,790	0.1
Porto Rico	281,363	5.3	348,511	6.1	418,613	9.1
Philippine Islands	221,677	4.2	240,183	4.2	146,908	3.2
Sugars from foreign molasses, U. S. maple, etc.	2,342	.....	2,660	0.0	2,547	0.1
Total domestic	2,248,986	42.0	2,424,599	42.5	2,480,179	53.9
Cuba	2,966,010	55.4	3,237,440	56.8	2,090,091	45.5
Other foreign full duty	139,370	2.6	41,850	0.7	29,937	0.6
Total foreign	3,105,380	58.0	3,279,290	57.5	2,120,028	46.1
Grand total	5,354,366	100.0	5,703,889	100.0	4,600,207	100.0

* Weekly Statistical Sugar Trade Journal, p. 15, Jan. 11, 1923. Figures reduced to tons of 2,000 pounds.

Roughly speaking, it will be seen that a little less than half of the average total consumption from

1921 to 1923 was derived from domestic sources. The proportion was only about one-third in 1920. It increased to over one-half in 1921 but fell back to about two-fifths in 1923. Of the sources of domestic supply, the beet-sugar industry is the most important, ranging from 17 to 23 per cent for the three years. Following in order of magnitude are Hawaii, Porto Rico, Louisiana and Texas, and the Philippine Islands, averaging for the three years 10 per cent, 6.7 per cent, 5.5 per cent, and 3.9 per cent respectively.

The figures in Table IV (p. 65) have, of course, a relation to the figures for domestic production, imports, and exports, but considerable adjustment is necessary before the two sets of data will check. In the first place, all the figures for consumption are in terms of refined sugar and therefore, except in the case of domestic beet and some Louisiana sugar, are not the same as would be derived from production and import statistics. The latter data refer in general to raw sugar, of which it takes roughly 107 pounds to produce 100 pounds of refined sugar. Moreover, import statistics include sugar imported for the purpose of being further manufactured for reexport. This is an important business. In 1921 drawback was allowed on 557,856 tons of sugar. The greater part of these reexports are in the form of refined sugar, but numerous other items, such as confectionery, condensed milk, canned fruits, chewing gum, and other articles, come in for a part of the drawback based on their sugar content. Again, not all of the domestic output is domestically consumed.

A considerable portion of the Philippine output is exported to countries other than the United States. Finally, statistics for production are based on the crop year, which includes part of two calender years. For example, the beet-sugar production for 1921–22 refers to the crop which was grown in 1921 and converted into sugar in the last months of 1921 and the first months of 1922. A part of this crop would be included in the consumption data for 1921, but the greater part in the consumption data of 1922. For the above reasons consumption can not be directly inferred from production, import, and export figures.

The growth of the domestic industry in the several regions of production, both absolute and relative to the total consumption, is shown in Table V (pp. 68–69). The striking facts shown by the table are: (1) The great increase in total consumption, both absolute and per capita. Since 1890 the absolute consumption has increased to nearly three and a half times the tonnage of 1890, and the per capita consumption has nearly doubled. (2) The increase in the proportion of the total consumption derived from domestic sources from about 25 per cent to about 50 per cent. (3) The declining importance as a factor in total consumption of full-duty sugar after 1903, when a preferential rate of 20 per cent less than the full duty was given to Cuba. Previous to 1903 foreign sugar from sources other than Cuba on several occasions exceeded 50 per cent of the total domestic consumption. After 1903 it rapidly declined and in recent years, except for the abnormal year 1920, it may be regarded as of negligible impor-

TABLE V.—TOTAL AND PER CAPITA CONSUMPTION OF SUGAR IN THE UNITED STATES AND PERCENTAGE OF TOTAL BY SOURCES FOR THE CALENDER YEARS 1890–1923, INCLUSIVE

All figures reduced to a refined-sugar basis *

Year	Total consumption	Per capita consumption	Percentage of total consumption											
			Continental United States			U. S. insular possessions				Sugar from foreign molasses, maple, etc.	Total domestic [d]	Cuba	Other foreign	Total foreign
			Cane	Beet	Total	Hawaiian Islands [a]	Porto Rico [b]	Philippine Islands [c]	Total [d]					
	Tons	*Pounds*												
1890	1,653,542	52.8	9.25	0.19	9.44	6.62	2.27	7.67	16.56	5.40	31.40	30.01	38.59	68.60
1891	2,115,514	66.3	11.75	0.29	12.04	7.92	2.03	2.35	12.30	2.48	26.82	34.85	38.33	73.18
1892	2,075,774	63.8	11.01	0.65	11.66	6.40	1.96	2.37	10.73	2.16	24.55	48.09	27.36	75.45
1893	2,135,569	64.4	12.37	0.84	13.21	6.60	2.27	2.79	11.66	1.63	26.50	41.68	31.82	73.50
1894	2,254,239	66.7	13.48	1.02	14.50	6.45	1.49	2.45	10.39	1.01	25.90	41.35	32.75	74.10
1895	2,183,714	63.4	16.64	1.54	18.18	6.24	1.28	1.56	9.08	1.17	28.43	41.66	29.91	71.57
1896	2,195,297	62.5	12.41	2.04	14.45	7.73	1.78	3.18	12.69	0.30	27.44	23.87	48.69	72.56
1897	2,319,496	64.8	14.99	1.92	16.91	7.33	1.47	1.24	10.04	0.25	27.20	9.41	63.39	72.80
1898	2,243,250	61.5	12.62	1.72	14.34	15.97	3.15	0.94	20.06	0.34	34.74	13.75	51.51	65.26
1899	2,327,436	62.6	7.72	3.02	10.74	10.36	2.40	1.16	13.92	0.49	25.15	14.67	60.18	74.85
1900	2,486,229	65.2	7.86	3.73	11.59	11.10	1.59	1.08	13.77	0.57	25.93	15.23	58.84	74.07
1901	2,656,994	68.7	12.31	5.26	17.57	13.03	2.79	0.22	16.04	0.97	34.58	18.23	47.19	65.42
1902	2,874,041	72.8	11.53	5.79	17.32	12.12	3.31	0.10	15.53	1.13	33.98	21.45	44.57	66.02
1903	2,855,600	70.9	11.48	9.71	21.19	14.04	3.37	1.17	18.58	1.05	40.82	33.81	25.37	59.18
1904	3,099,221	75.3	11.70	6.15	17.85	11.95	4.23	0.80	16.98	0.99	35.82	40.85	23.33	64.18

1905	2,948,082	70.5	12.71	8.39	21.10	14.30	4.75	0.56	19.61	0.79	41.50	41.85	16.65	58.50
1906	3,207,694	76.1	9.36	10 49	19.85	12.01	6.77	1.46	20.24	0.49	40.58	40.71	18.71	59.42
1907	3,353,256	77.5	8 85	12.53	21.38	13.97	7.12	0.37	21.46	0.54	43.38	44.76	11.86	56.62
1908	3,568,084	81.2	12.27	15.48	27.75	14.23	5.81	1.41	21.45	0.53	49.73	28.78	21.49	50.27
1909	3,648,580	81.8	12 59	13.32	25.91	14.85	7.22	1.43	23.50	0.62	50.03	43.82	6.15	49.97
1910	3,752,398	81.6	9.94	13.64	23.58	13.70	8.26	2.89	24.85	0.45	48.88	48.96	2.16	51.12
1911	3,753,558	79.2	8.59	15.12	23.71	14.39	8.37	5.03	27 79	0.51	52.01	42.05	5.94	47.99
1912	3,924,684	81.3	7.34	14.75	22 09	15.02	8.15	3.76	26.93	0.43	49.45	47.51	3.04	50.55
1913	4,192,316	85.4	5.55	16.70	22.25	13.53	8.85	1.19	23.57	0.52	46.34	53.19	0.47	53.66
1914	4,212,126	84.3	3.83	16.60	20.43	13.57	7.29	3.21	24.07	0.54	45.04	53.68	1.28	54.96
1915	4,257,715	83.8	5.91	20.24	26.15	13.40	7.90	3.16	24.46	0.41	51.02	48.43	0.55	48 98
1916	4,097,640	79.3	6.15	19.14	25.29	14.59	10.74	3.04	28.37	0.38	54.04	45.55	0.41	45.96
1917	4,125,631	78.6	7.02	21.31	28.33	16.07	11.71	1.97	29.89	0.72	58.94	40.91	0.15	41.06
1918	3,915,079	73.4	6.47	15.10	21.57	12.30	9.48	1.33	23.22	0.84	45.63	53.82	0.55	54.37
1919	4,555,792	85.4	3.79	21.44	25.23	12.66	7.05	1.78	21.69	0.84	47.76	50.82	1.42	52.24
1920	4,574,833	86.6	1.85	11.12	12.97	9.56	8.20	2.79	20.81	0.42	34.20	52 24	13.56	65.80
1921	4,600,207	84.5	6.64	23.06	29.70	11.74	9.10	3.19	24.16	0.06	53.92	45.43	0.65	46.08
1922	5,703,889	103.2	5.36	17.62	22.98	9.06	6.12	4.21	19.48	0.05	42.51	56.76	0.73	57.49
1923	5,354,316	95.6	4.51	18.41	22.92	9.62	5.26	4.14	19.02	0.04	42.01	55.39	2.60	57.99

* Concerning Sugar, pp. E54–A–B–C.

[a] Hawaiian sugar should be classed as foreign sugar until 1898, when the Hawaiian Islands were annexed to the United States. Sugar from the Hawaiian Islands, however, has been admitted free since 1876, in which year a reciprocity treaty was concluded with the United States.

[b] Porto Rico became United States territory in 1899. Up to that date Porto Rican sugar should be classed as foreign sugar. It was admitted at 85 per cent reduction from full duty after May 1, 1900, and free of duty from 1901 to date.

[c] The Philippine Islands became United States territory in 1899. Philippine sugar was admitted at a 25 per cent reduction in 1902. From 1909, sugar not to exceed 300,000 tons was to be admitted free of duty. The Act of 1913 admitted Philippine sugar to any amount unconditionally free. This provision was unchanged in the acts of 1921 and 1922.

[d] The totals in this column include a small percentage of sugar from the Virgin Islands after their annexation in 1917, amounting in 1917 to 0.14 per cent; 1918, 0.11; 1919, 0.2; 1920, 0.26; 1921, 0.13; 1922, 0.09; and 1923, 0.03 per cent.

tance. (4) The increase in the importance of domestic beet sugar in the total consumption from only about two-thirds of 1 per cent to about 20 per cent, and also its increasing importance as compared with other sources of domestic supply.

It will be noted that the increasing importance of domestic sugar in the total consumption is due chiefly to beet sugar. Continental cane sugar (Louisiana and Texas) shows a decided decline. Philippine Island sugar, while fluctuating greatly, shows no marked tendency either to increase or decline. Even Hawaiian and Porto Rico sugars show in recent years percentages less than their maxima. This decrease in the relative importance of Porto Rico and the Hawaiian Islands is not to be interpreted as indicating a tendency to decline in absolute tonnage output. It rather indicates that they have about reached their limits, and that, while the absolute output may remain approximately constant, their relative importance in a constantly increasing total consumption must show a tendency to decline.

Since 1890 no rate of duty has been so low as to prevent steady growth of the domestic industry. During the last thirty years several tariff revisions have been made. The duty on sugar has been raised in some acts and lowered in others. The facts brought out by Table V are conclusive evidence that, while the domestic industry may have been more stimulated under some acts than others, under no act has the rate been so low as seriously to retard its steady forward march.

Percentages of Total Consumption under Specific Acts.—Under the bounty of 2 cents per pound granted to domestic sugar in the Act of 1890 the average percentage of domestic sugar in total consumption was 26.8; under the Act of 1894, imposing a duty of 40 per cent (about 0.8 of a cent per pound) upon foreign sugar, the average percentage was 27.3; under the Act of 1897 (to 1903), imposing a duty of 1.685 cents per pound on foreign sugar, the average percentage was 32.7; under the Act of 1897 (after 1903) and under the Act of 1909, both imposing a duty on Cuban sugar of 1.348 cents per pound, the average percentage was 45.7; under the Act of 1913, imposing a duty of 1.0048 cents per pound on Cuban sugar, the average percentage was 48.1.

Was the rate under the Act of 1913 sufficient to maintain the domestic industry at its highest level of relative importance? It is possible that the rate 1.0048 would have been insufficient to maintain the domestic industry permanently at so high a percentage in the total consumption as the above average (48.1). It will be noted that after 1917, when the domestic percentage touched high-water mark (58.94), there was a decline so long as the rate 1.0048 remained in force (45.63 in 1918, 47.76 in 1919, 34.20 in 1920). In 1921, the year in which the Emergency tariff (1.6 cents per pound on Cuban sugar) went into effect, there was a marked gain to 53.92 per cent. In the following year (1922) there was again a decline to 42.51. In this year the Emergency rate remained in effect until September 22, when the present tariff act went into effect,

placing the rate at 1.7648 cents per pound on Cuban sugar. During the last three years, however, conditions in the sugar industry have been so abnormal that it would be extremely rash to attribute changes in the percentages for the domestic industry to changes in the tariff.

One cause of the great falling off in percentage in 1920 was the phenomenal importation of full-duty sugar in that year. The great rebound in 1921 can hardly be attributed directly to the tariff. The Emergency Act did not go into effect until May; and by that time the domestic and Cuban crops were already committed to a pretty definite output. As will be shown later, the Emergency Act had no appreciable effect either upon imports or prices until 1922. The percentage given (53.92) might have been as high, so far as any direct influence of the Emergency Act can be traced, had the rate of 1.0048 of the Act of 1913 remained in effect. The most that can be said is that domestic producers may have been somewhat stimulated by the Republican victory in 1920 and the anticipation of a higher rate.

III. TOTAL DOMESTIC AND CUBAN PRODUCTION

Over 99 per cent of the sugar consumed in the United States is derived from the continental United States; Porto Rico; the Hawaiian, Philippine, and Virgin islands; and Cuba. Table VI shows for recent years the total production in the regions which together furnish over 99 per cent of the sugar consumed in the United States. It is to be noted that

TABLE VI.—PRODUCTION OF SUGAR FOR THE CROP YEARS SPECIFIED IN THE REGIONS WHICH NORMALLY FURNISH OVER 99 PER CENT OF THE UNITED STATES SUGAR SUPPLY *

	Grinding or slicing period	1922–1923			1921–1922			1920–1921			1919–1920		
		Thousand tons	Per cent	Per cent grand total	Thousand tons	Per cent	Per cent grand total	Thousand tons	Per cent	Per cent grand total	Thousand tons	Per cent	Per cent grand total
CANE SUGAR:	*Grinding*												
Louisiana	Oct.–Jan.	241	16.1	3.6	324	19.4	4.5	169	11.1	2.4	116	8.2	1.9
Texas	Oct.–Jan.	3	0.2	0.0	3	0.2	0.0	7	0.5	0.1	1	0.1	0.0
Porto Rico	Jan.–June	392	26.2	5.9	406	24.3	5.7	491	32.1	7.0	485	34.5	7.7
Hawaiian Islands	Nov.–July	533	35.7	8.0	549	33.0	7.7	569	37.2	8.1	557	39.6	8.8
Virgin Islands	Jan.–June	6	0.4	0.1	5	0.3	0.1	5	0.3	0.1	12	0.9	0.2
Philippine Islands	Nov.–June	319	21.4	4.8	379	22.8	5.3	287	18.8	4.1	234	16.7	3.7
Total domestic cane	.....	1,494	100.0	22.4	1,666	100.0	23.3	1,528	100.0	21.8	1,405	100.0	22.3
Cuba	Dec.–June	4,480	....	67.4	4,476	....	62.5	4,408	....	62.7	4,178	....	66.2
Total cane	.....	5,974	....	89.8	6,142	....	85.8	5,936	....	84.5	5,583	....	88.5
BEET SUGAR:	*Slicing*												
California	July–Oct.	73	10.8	1.1	171	16.7	2.3	168	15.4	2.4	131	18.1	2.1
Colorado	Oct.–Jan.	183	27.1	2.8	295	28.9	4.1	294	27.0	4.2	194	26.7	3.1
Idaho	Oct.–Jan.	40	5.9	0.6	57	5.6	0.8	57	5.2	0.8	26	3.6	0.4
Michigan	Oct.–Jan.	81	12.0	1.2	122	12.0	1.7	166	15.2	2.3	130	17.9	21.
Nebraska	Oct.–Jan.	87	12.9	1.3	105	10.3	1.5	90	8.3	1.3	61	8.4	0.9
Ohio	Oct.–Jan.	25	3.7	0.4	26	2.5	0.4	47	4.3	0.7	32	4.4	0.5
Utah	Oct.–Jan.	110	16.3	1.7	156	15.3	2.2	163	15.0	2.3	101	13.9	1.6
Wisconsin	Oct.–Jan.	8	1.2	0.1	14	1.4	0.2	21	1.9	0.3	11	1.5	0.2
Other States	Oct.–Jan.	68	10.1	1.0	74	7.3	1.0	84	7.7	1.2	40	5.5	0.6
Total beet	.....	675	100.0	10.2	1,020	100.0	14.2	1,090	100.0	15.5	726	100.0	11.5
Grand total, cane and beet	.....	6,649	....	100.0	7,162	....	100.0	7,026	....	100.0	6,309	....	100.0

* Concerning Sugar, pp. E-2, 3, 3½ and E-27, 1922. Also Weekly Statistical Sugar Trade Journal, Jan. 11, 1923.

not all of the sugar referred to in the table is actually consumed in the continental United States. Some of the Porto Rican, Hawaiian, Virgin Islands, Philippine, and Cuban production is consumed locally. Some Philippine and Cuban sugar is exported direct to countries other than the United States; and some Cuban sugar is first imported into the United States and later exported as refined sugar or as an ingredient of certain manufactures containing sugar. On the other hand, a small amount of sugar comes from countries not shown in the table. Among them are Peru, certain other South and Central American countries, and the Dominican Republic. Sugar from these countries is subject to full duty, and hence comparatively little is imported except for reexport. All of the beet sugar is refined sugar. Practically all of the cane sugar, except a part of the Louisiana output, is raw sugar, about 95 per cent of which tests from 94° to 96° by the polariscope.

For many years the United States can fill its sugar needs from present sources of supply. As previously noted, the consumption, both absolute and per capita, is rapidly growing and the question arises from what sources the United States in the future can supply its increasing needs. Of the regions mentioned in the table, it is unlikely that Louisiana and Texas will greatly increase their output. Indeed, production in these States is showing a tendency to decrease rather than increase. For the five-year period 1905–09 it averaged 349,000 tons, for the five-year period 1910–14 it fell to 302,000

tons, and for the five-year period 1915–19 it again fell to 242,000 tons. The last three years have shown a slight average increase to 249,000 tons. Because of climatic conditions, the crop fluctuates considerably. In 1920–21 it was only 176,000 tons. The next year it increased to 328,000 tons but fell back to 244,000 tons in 1922–23. It is probable that production has about reached its limit in Porto Rico and the Hawaiian Islands. Because of their small area, no very great increase relatively to the total consumption is to be expected from the Virgin Islands.

There are still, however, great possibilities of increased production in the Philippine Islands, Cuba, and the States producing beet sugar. In addition to these sources of supply, promising experiments are under way in Florida, where large areas have been acquired by responsible parties for the growing of cane and factories are in process of erection. It would seem that for many years the United States demand can be met from the sources mentioned in the table and from Florida, without drawing to any considerable extent on other countries now supplying small amounts of full-duty sugar.

The Seaboard Refineries.—The data so far given in in the present chapter refer, with the exception of Cuba, to the so-called domestic producers, that is, to the producers of raw cane sugar in the continental United States and the Hawaiian, Philippine, and Virgin islands, and of refined beet sugar in some 16 States. The great seaboard refiners are also in

a sense "domestic producers," but they represent a different phase of the industry and are not usually so classed. In tariff matters, indeed, their interests are antithetic to those of the "domestic producers." They purchase raw cane sugar of domestic or foreign origin and convert it into refined sugar. Refined sugar, however, is not the only product of the refineries. They market also "soft sugars," "brown sugars" of a grade lower than refined but higher than raw, and sugar sirups.

There are 22 refineries located in cities along the Atlantic and Pacific seaboards and in Louisiana and Texas. The largest company is the American Sugar Refining Company, which controls seven of the 22 refineries. In its early history the company was itself a consolidation of several companies which had previously operated for some years under a "trust" form of organization, popularly known as the "Sugar Trust." The "trust" having been declared illegal, the constituent companies reorganized as the American Sugar Refining Company. It is still popularly known as the "sugar trust," although, as the trust form of organization has been abandoned, that appellation is no longer in a legal sense correct. Moreover, its proportion of the total output is declining.

Output.—With the exception of the beet sugar produced in the United States and some of the cane sugar produced in Louisiana, all the refined sugar consumed in the United States and all that is exported from the United States are the product of these seaboard refineries. After excluding the beet

sugar, the total consumption of refined sugar in the United States for the years 1920, 1921, and 1922 was 3,383,000, 3,302,000, and 4,699,000 tons respectively. If to these figures be added the exports, the total output of the refineries for those years may be estimated at 3,845,000, 3,769,000, and 5,617,000 tons respectively.

The tariff interest of the seaboard refineries is for lower duties or no duty. The seaboard refineries are concerned only negatively in the tariff. It is true that they enjoy a net protection on their finished product, but their large export trade indicates their ability to compete in the markets of the world. The duty on raw sugar, however, raises the price of their raw material and makes competition with the beet-sugar producers in the domestic market more difficult. Because of the drawback, it does not so seriously interfere with their export trade, though even in that it is something of a handicap.[1] Their interest, therefore, on the whole calls for a reduction or removal of the duty on raw sugar.

IV. IMPORTS

In 1903 a reciprocity treaty was concluded with Cuba, arranging for mutual tariff concessions. Cuban sugar was granted a 20 per cent reduction

[1] They lose 1 per cent of the duty paid on raw sugar even in the case of the export trade. Allowance must also be made for interest on the amount paid in duty from the time of import to the time when the drawback is paid, and for the inconvenience to which they are put in the refining process by certain regulations imposed by the Treasury in order to show that they are entitled to the drawback. See also footnote, p. 78.

from the full duty. Previous to 1903 large quantities of sugar were imported from various sugar-producing countries throughout the world, and such importations continued, but in diminishing quantities, for several years thereafter. So long as the full-duty imports continued in considerable quantities they tended to dominate the market, and the Cuban producers rather than the American consumers received the benefit of the tariff concession. In this respect the result of the concession was not different from that of a previous concession in 1876, which granted the free admission of sugar from the Hawaiian Islands.

The possibilities of increased sugar production, however, were much greater in Cuba than in the Hawaiian Islands; and the large profits resulting from the concession so stimulated the production in Cuba that competition among the producers for the American market gradually reduced the price below that at which producers in other regions (who were subjected to the full duty) could afford to sell in the United States. As under the influence of such competition the price of Cuban sugar was reduced, it came to dominate the American market to the exclusion of all other foreign sugars. The benefit of the concession then shifted from the Cuban producers to the American consumers. At present, except for such imports as are brought in for refining or manufacture and reexport with benefit of drawback, importations of full-duty sugar are almost negligible.[1]

[1] Persons importing sugar for refining or for manufacture into

The gradual displacement of full-duty sugar by Cuban sugar is shown in the table of imports since 1890. (See Appendix C, p. 272.) Imports from foreign countries and from the Philippine and Virgin islands and receipts from Porto Rico and the Hawaiian Islands are shown for the years 1919–22 inclusive in Table VII. Sugars from the Hawaiian Islands and Porto Rico are not classed as imports in the publications of the Department of Commerce. Those from the Philippine and Virgin islands are so classed but may nevertheless be regarded as of domestic production. All the dutiable sugar is foreign sugar.

It will be noticed that the imports of foreign sugar showed a considerable falling off in 1921 from those of 1920 but that in 1922 they greatly increased. In fact, the imports of 1922 broke all previous records, in spite of the fact that they were subject to a higher

confectionery, jams, soft drinks, or other products containing sugar are allowed a drawback amounting to 99 per cent on the duty paid at the time of importation, upon the submission of proof that the sugar so imported has been used in the production of articles which were subsequently exported. Except for the small difference between 1 per cent of the full duty and 1 per cent of the Cuban duty, and the difference between the interest on the full duty and the interest on the Cuban duty during the time between payment of duty and the receipt of the drawback, it makes no difference to such importers whether they import full-duty or Cuban sugars. A slight concession in price may lead them to import the former. Hence, considerable quantities of full-duty sugar are annually imported for the purpose of refining or manufacture and reexport. In 1920, owing to exceptional conditions, considerable full-duty sugar was also imported for consumption. In that year imports of full-duty sugar amounted to 25.5 per cent of the total dutiable sugar imports, in 1919, to only 1.9 per cent; in 1921, to 7.9 per cent; and in 1922, to 6.9 per cent. (See Table VII.)

TABLE VII.—Imports of Sugar* from Foreign Countries into, United States

Region	1922			1921	
	Thousand tons	Per cent	Thousand dollars	Thousand tons	Per cent
Dutiable					
Cane sugar:					
Cuba	4,527	98.8	227,257	2,590	92.1
Dominican Republic	2	....	79	129	4.6
Dutch East Indies	....	....	....	17	0.6
Haiti	....	....	....	5	0.2
Honduras	5	0.1	270	6	0.2
Mexico	21	0.5	2,831	12	0.4
Nicaragua	9	0.2	558	8	0.3
Peru	3	0.1	211	10	0.4
All others	13	0.3	819	35	1.2
Total cane	4,580	....	232,025	2,812	....
Beet sugar	None	....	....	None	....
Total dutiable	4,580	100.0	232,025	2,812	100.0
Free of duty					
Cane:					
Hawaiian Islands	568	....	46,915	541	....
Philippine Islands	277	....	19,299	165	....
Porto Rico	360	....	31,131	469	....
Virgin Islands	4	....	581	6	....
Total free	1,209	....	97,926	1,181	....

*Commerce and Navigation, 1921–22, U. S. Bur.

† Virtually all of the sugar shown in the table is raw and

AND RECEIPTS OF SUGAR FROM THE INSULAR POSSESSIONS BY, THE FOR 1919–22 †

	1920			1919		
Thousand dollars	Thousand tons	Per cent	Thousand dollars	Thousand tons	Per cent	Thousand dollars
194,157	2,881	74.5	668,902	3,343	98.1	373,706
9,310	92	2.4	24,682	4	0.1	706
4,579	273	7.0	86,668	15	0.4	1,656
330	2	0.0	599	4	0.1	486
467	8	0.2	2,028	8	0.2	1,332
2,343	31	0.8	9,932	10	0.3	2,442
742	9	0.2	2,064	....	....	36
1,248	104	2.7	24,201	8	0.2	981
4,121	455	11.7	143,074	20	0.6	2,497
217,297	3,855	....	962,150	3,412	....	383,842
1	18	0.5	6,402	none		
217,298	3,873	100.0	968,552	3,412	100.0	383,842
47,905	550	....	158,712	579	....	76,306
17,440	146	....	42,417	88	....	7,941
47,637	413	....	119,732	364	....	52,783
550	13	....	4,220	10	....	1,388
113,532	1,122	....	325,081	1,041	....	138,418

Foreign and Domestic Commerce, Dept. Comm., 1923.

about 95 per cent of it tests from 94° to 96° by the polariscope.

rate of duty than had been imposed upon sugar under any act since the Act of 1883.[1] It will further be noted that over 93 per cent of the enormous imports of 1922 were derived from Cuba, and that imports of beet sugar, formerly important, had become insignificant. The total for 1923 was 3,854,457 tons, a drop of nearly 16 per cent from the total of 1922.

V. EXPORTS

Exports consist of refined sugar of foreign origin. The Philippine Islands export a considerable quantity of raw sugar to countries other than the United States. With this exception no raw sugar, whether of domestic or foreign origin, is exported from United States territory. No raw sugar is exported, because domestic producers can get a better price for their product in the United States than in any foreign country. Making allowance for transportation costs, the best price that they could obtain in any foreign country would be the c. and f. price,[2] New York, while the domestic price is always higher than the c. and f. price by the amount of the tariff. The Philippine Islands are so remote from United States ports that transportation costs just about neutralize the advantage caused by the tariff. Hence, considerable Philippine Islands sugar is exported to foreign countries, especially China.

[1] Beginning with May 27, 1921, the duty, previously 1 cent per pound on 96° centrifugals, was increased to 1.6 cents per pound, and on September 22, 1922, to 1.76 cents per pound.

[2] Costs and freight: that is, the price landed in an American port before the duty is paid.

We do, however, export large quantities of refined sugar, all of which is derived from foreign raws. This is due to the fact that the seaboard refiners can purchase their foreign raws at the c. and f. price, whereas for domestic raws they would be obliged to pay the duty-paid price. It is true that after purchasing the foreign raws they pay the duty, but they get 99 per cent of it back as drawback when the sugar refined from the foreign raws is exported. (See footnote, p. 78.)

Refining for export is a large and growing business, as is shown in Table VIII (pp. 84–85.)

The most noteworthy feature of Table VIII is the great tonnage increase that 1922 shows over any preceding year. Exports for 1922 were 918,361 tons, about double the exports of 1920 and 1921 and 26 times the average exports for the five-year period 1910–14.[1] The war greatly increased this export business, sugar from the United States being in demand to take the place of beet sugar from Europe. It will be noticed that in all of the years following 1914 considerable exports are shown to France, Greece, Italy, Netherlands, Norway, and Spain, to none of which countries were there any exports during the five-year period 1910–14. Germany, which before the war was among the largest sugar-exporting countries in the world, imported 53,000 tons in 1922. The United Kingdom remains the largest purchaser of United States sugars. She held this position before the war although, her chief

[1] Exports fell off greatly in 1923, the total for that year being 222,458 tons.

TABLE VIII.—Total Exports of Refined Sugar from the for 1920, 1921, and 1922; also Averages for the Two

Destination	1922		1921	
	Thousand tons	Thousand dollars	Thousand tons	Thousand dollars
Argentina	25	1,688	17	1,600
Canada	1	53	3	449
France	169	12,797	59	5,390
Germany	53	4,061	3	324
Greece	36	2,680	48	5,467
Italy	25	1,935	25	2,915
Mexico	3	319	14	1,647
Netherlands	29	2,200	11	1,022
Newfoundland, Labrador	2	137	3	386
Norway	37	2,837	12	998
Panama	1	123	1	123
Spain	28	2,096	17	2,442
Turkey in Europe	30	2,398	10	1,143
United Kingdom	300	22,604	182	18,408
Uruguay	18	1,317	13	1,544
All others	161	12,435	49	4,969
Total	918	69,680	467	48,827

* Commerce and Navigation, 1914, 1918, and 1921. Also, Monthly Summary

UNITED STATES, WITH PRINCIPAL COUNTRIES OF DESTINATION, PREVIOUS FIVE-YEAR PERIODS, 1910–14 AND 1915–19 *

1920		1915–19		1910–14	
Thousand tons	Thousand dollars	Thousand tons	Thousand tons	Thousand tons	Thousand dollars
...	1	19	2,486	....	1
3	779	7	856	....	21
174	35,038	163	20,157		
1	244				
10	2,308	8	925		
1	194	18	2,396		
6	1,597	9	1,288	2	155
6	1,512	3	313		
...	142	4	432	4	328
34	7,198	24	3,193		
...	127	2	252	3	233
24	5,739	15	2,016	.....	7
8	2,269				
132	24,388	180	19,380	18	1,626
...	57	13	1,583		
63	13,284	47	5,209	8	598
462	94,877	512	60,486	35	2,969

of Foreign Commerce of the United States, June, 1920, and December, 1922.

source of supply then being Germany, her imports of sugar from the United States were comparatively small—averaging 18,000 tons for the period 1910–14. By 1922 they had increased to 300,000 tons.

Because of the relation in recent years of United States exports to the beet-sugar situation in Europe, it is not unlikely that some of this business will be lost as the beet-sugar production returns to normal. The refining of sugar, however, is an industry which lends itself peculiarly to large-scale production, a fact which contributes to the efficiency of the great seaboard refineries. Their proximity to Cuba, the region of lowest cost sugar production in the world, also gives them an advantage. Even under more normal conditions they should be able to compete successfully in the world market. Probably a large part of the increased export business brought about by the war has come to stay, and from now on sugar is likely to enter into our export trade as an important item.

VI. REVENUE YIELDED TO UNITED STATES

From the standpoint of revenue, sugar is the most important article in the tariff. In 1920 the total revenue derived from imports was $325,645,565, of which sugar furnished $78,891,520, or 24.2 per cent; the corresponding figures for 1921 were total, $292,396,752, sugar, $70,914,119, or 24.2 per cent; in 1922, total, $458,359,415, sugar, $115,525,000, or 25.2 per cent; in 1923, total, $566,136,864, sugar, $127,475,381, or 22.5 per cent.

PART II

THE SUGAR TARIFF

CHAPTER IV

MAGNITUDE AND CHARACTER OF SUGAR DUTIES, PAST AND PRESENT

Part I has been devoted to general information with respect to the sugar industry. The purpose has been to enable the reader to see the whole situation in proper perspective and thereby to arrive at an independent judgment. Knowing something of the character of the industry, its habitat and growth, the labor problems involved, its importance with respect to output and capital investment, its importance also in the import and export trade and as a source of revenue to the Treasury, he will be prepared to enter into the discussion of the tariff policy which should be applied to it.

In Part II the tariff discussion is undertaken. In the present chapter a brief historical survey of the duties which have, in fact, been applied to sugar will be given. This will be followed in Chapter V by a study from the standpoint of economic theory and by statistical methods of the extent to which the industry is dependent upon the tariff and of the effect of changing the rate of duty upon prices, imports, and domestic producers. In Chapter VI the changes in the tariff under specific acts and the effect of these changes on prices and on the growth of the domestic industry will be dis-

cussed. Chapter VII will discuss the amount of protection involved in transportation charges. In Chapter VIII arguments for and against a duty on sugar will be presented. Finally, in Chapter IX the subject matter of the book will be briefly summarized, all of the evidence will be weighed, and a judgment rendered.

The present chapter will discuss the history of the successive duties under three heads: I. Method of levying duties. II. The tariff: a stimulus to the industry but a burden on consumers. III. Foreign tariffs.

I. METHODS OF LEVYING DUTIES

Duties may be either ad valorem or specific. An ad valorem duty is a percentage charge based on the value of the goods imported. A specific duty is a charge in cents or dollars on a unit weight or quantity of the import, as 2 cents per pound, 40 cents per bushel. Both ad valorem and specific duties have been applied to sugar. In the case of specific duties the rate has been expressed in terms of cents per pound on various grades of sugar classified by recognized trade names, as brown, clayed, etc., or in accordance with a sliding scale based on sugar content. The test for classification based on sugar content has been made by the Dutch standard or the polariscope.

Early duties were specific and were assessed in accordance with trade names. In the Act of 1789 the rates were, "on brown sugars, per pound, 1 cent; on loaf sugars, per pound, 3 cents; on all other

sugars, per pound, 1.5 cents." In the Act of 1816 the rates were, "on brown sugar, 3 cents per pound; on white clayed or powdered sugar, 4 cents per pound; on lump sugar, 10 cents per pound; on loaf sugar and on sugar candy, 12 cents per pound." In the Act of 1842 the rates were, "on raw sugar (commonly called brown sugar), not advanced beyond its raw state, by claying, boiling, clarifying, or other process, and on sirups of sugar, or of sugar cane, and on brown clayed sugar, 2.5 cents per pound; on all other sugars, when advanced beyond the raw state, by claying, boiling, clarifying, or other process and not yet refined, 4 cents per pound; on refined sugars (whether loaf, lump, crushed, or pulverized, and when, after being refined, they have been tinctured, colored, or in any way adulterated), and on sugar candy, 6 cents per pound."

Successive acts were plainly drawn more and more with the object of making a more careful discrimination for tariff purposes between different grades and lead, naturally, to the classification by sugar content. This tendency was temporarily arrested by the Act of 1846, in which sugar was included in schedule C, providing for a duty of 30 per cent ad valorem upon all articles included therein.

Later duties were based on sugar content either by the Dutch standard or polariscopic test. A duty based on sugar content first appeared in the Act of August 5, 1861. The test in this act was to be made by the Dutch standard.[1] Sugars testing not more

[1] The Dutch standard is a color test. Samples of sugar ranging from very dark, No. 8, to almost white, No. 25, are prepared every

than No. 12, Dutch standard, were dutiable at a rate of 2 cents per pound; above No. 12, at 2.5 cents per pound and, when refined, at 4 cents per pound. The Dutch standard continued to be used as a test in subsequent acts, with a tendency to an increase in the number of subdivisions. The Act of 1870, for example, imposed on sugars testing not above No. 7, Dutch standard a rate of 1.75 cents per pound; above No. 7 and not above No. 10, of 2 cents; above No. 10 and not above No. 13, of 2.25; above No. 13 and not above No. 16, of 2.75 cents; above No. 16 and not above No. 20, of 3.25 cents; and above No. 20, of 4 cents.

The polariscopic test [1] first appears in the Act of 1883, in which it is applied in connection with the Dutch standard test. Sugars testing not above No. 13, Dutch standard and not above 75° by the polariscope were dutiable at the rate of 1.4 cents per pound with an additional duty of 0.04 of a cent per pound for each additional polariscopic degree. For sugars above No. 13, the Dutch standard test alone applied. The rates were as follows: above No. 13

year by two firms in Holland under the supervision of the Netherlands Trading Society and are sealed in glass bottles. Testing sugar by the Dutch standard means simply matching its color with that of one of the sealed samples and assigning it the same number.—*The Sugar Industry: U. S. Dept. Comm. Misc. Ser. 9, p. 69, 1913.*

[1] In applying the polariscopic test, a beam of polarized light is passed through a sugar solution contained in the tube of the polariscope. It is a property of the sugar solution to rotate the beam to the right, the scale being so graduated that pure sucrose will show a reading of 100° and any other reading will show the percentage of pure sucrose in the sample. For example, a reading of 96° means that the sample is 96 per cent pure.

and not above No. 16, 2.75 cents per pound; above No. 16 and not above No. 20, 3 cents per pound; above No. 20, 3.5 cents per pound.

Sugar was admitted free in 1890 and subject to an ad valorem duty in 1894. In the Act of 1890 sugar was placed on the free list but the domestic industry continued to receive protection in the form of a bounty of 2 cents per pound. Sugar was again made dutiable in the Act of 1894 at an ad valorem rate of 40 per cent.

The combined Dutch standard-polariscopic test was resumed in the Act of 1897. Sugars that tested not above No. 16, Dutch standard and not above 75° by the polariscope were assessed for duty at the rate of 0.95 of a cent per pound with an additional rate of 0.035 of a cent per pound for each additional degree. Sugars testing above No. 16, Dutch standard, were assessed at the flat rate of 1.95 cents per pound. The Act of 1909 made no change in the existing rates, except for sugars testing above No. 16, Dutch standard, on which the rate was changed to 1.9 cents per pound. Between these two acts, however, the Cuban reciprocity treaty went into effect, giving Cuban sugars a preferential rate 20 per cent lower than the rate on full-duty sugar. Hence, within a few years after the proclamation of this treaty in 1903, the great bulk of the imported sugars paid lower rates of duty than those provided for in the Acts of 1897 and 1909.

The polariscope was made the sole test in 1913. With the Act of 1913, the Dutch standard was abandoned; but in other respects the plan of assess-

ment for duty introduced in the Act of 1897 was continued, and was also continued in the Emergency Act of 1921 and in the Act of 1922, now in force. That is, a flat rate was assessed on sugars testing not above 75° by the polariscope with an additional rate for each additional degree. The rates, however, were different in those acts. The actual rates are shown in Table IX.

TABLE IX.—Rates of Duty on Sugar under the Acts of 1897, 1909, 1913, 1921 and 1922, Showing General Provisions and Rates on 96° Centrifugals, the Grades Chiefly Imported

Act of	Duty in cents per pound on sugars testing not above 75° by polariscope		Additional duty in cents per pound for each additional degree		Duty on 96° centrifugals	
	Full	Cuban	Full	Cuban	Full	Cuban
1897[a]	0.95	0.760[b]	0.035	0.0280[b]	1.685	1.3480[b]
1909[a]	0.95	0.760	0.035	0.0280	1.685	1.3480
1913	0.71	0.568	0.026	0.0208	1.256	1.0048
1921	1.16	0.928	0.040	0.0320	2.000	1.6000
1922	1.24	0.992	0.046	0.0368	2.206	1.7648

[a] If testing not above No. 16, Dutch standard.
[b] After 1903. Before 1903 the full-duty rate was also the Cuban rate.

Comparison of Rates on 96° Centrifugals (see Table IX) with Rates in Acts of 1883, 1890, and 1894.—Sugars testing about 96° by the polariscope constitute the bulk of imports and hence this grade may be conveniently used in comparing duties under different acts. The rates on this grade in the Act

of 1897 and subsequent acts are given in Table IX. In the Act of 1883 the polariscopic test was not applied to sugars above No. 13 Dutch standard, but the quantity of imported sugar testing above No. 13 was comparatively small. Moreover, the sugars constituting the great bulk of the imports at that time tested considerably less than 96°—say from 90 to 95°—the duties on which ranged from 2 to 2.24 cents per pound. Under the Act of 1890, 96° test sugars, like other sugars, were admitted free of duty, the domestic producers (p. 75–76) being granted a bounty of 2 cents per pound in lieu of a protective duty; under the Act of 1894 the rate was 40 per cent *ad valorem*, which, at prices prevailing at that time, was equivalent to a specific rate of about 0.8 of a cent per pound.

II. THE TARIFF: A STIMULUS TO THE INDUSTRY BUT A BURDEN ON CONSUMERS

Protection has been granted to the sugar industry in every tariff act from 1789 to the present time. From the foregoing brief review it will be seen that the sugar industry was given protection in the earliest act, the Act of 1789, and has received protection in every subsequent act.[1] The rates have sometimes been higher and sometimes lower but the protection has always been substantial. Under the shelter of this policy a large and flourishing domestic industry has developed and the percentage of total domestic consumption which has been domestically produced

[1] In the Act of 1890, under which sugar was admitted free of duty, protection was granted in the form of a bounty

has steadily increased. At the close of the Civil War only about 17 per cent of our consumption was of domestic origin. At the present time the domestic product, including sugar produced in the continental United States; Hawaiian, Philippine, and Virgin islands; and Porto Rico is about 45 per cent. To form an adequate conception of this growth of the domestic industry, it should be remembered that, along with this percentage increase, there has been during the same period more than an elevenfold absolute increase in consumption, from about 500,000 to 5,700,000 tons. The most noteworthy increase has been in the beet-sugar industry. As late as 1890 the production of domestic beet sugar was negligible. In 1921 it constituted 23 per cent of the entire domestic consumption.

The existence of a domestic-sugar industry is not wholly due to the tariff. The industry started in Louisiana nearly contemporaneously with the beginning of the United States itself; and probably Louisiana would have continued to produce some sugar had there been no tariff. This country received sugar from Porto Rico and Hawaii before they became United States territory.[1] A considerable portion of the output of the Philippine Islands is still exported to countries other than the United States. But, while all this is true, it may be confidently asserted that without the tariff the domestic

[1] It is to be noted that, except during the period of the McKinley Tariff, the Hawaiian Islands have been virtually United States territory, so far as the benefits of the tariff are concerned, since 1876, the date of the reciprocity treaty. But sugar was imported from them even before that date.

industry would not have attained anything like its present proportions. It is doubtful whether without this stimulus and other government aid the beet-sugar industry would have developed at all. The degree of dependence upon the tariff will be more fully discussed in the next chapter.

The burden upon consumers should be weighed against the prosperity of the domestic industry. This very satisfactory growth of the domestic industry has not been attained without cost. When a duty is imposed upon a commodity and a considerable portion of the domestic consumption continues to be imported, the price to domestic consumers will be higher than it would have been had the duty not been imposed. So far as this excess price applies to the sugar actually imported it may be regarded as a tax to be justified, as is any other tax, by the revenue which it yields to the government. But this same excess price above what the consumer would have paid had there been no duty applies also to the domestic product, where it may be regarded as a payment made by consumers for the satisfaction of having their sugar made by an American rather than a foreign producer. The magnitude of this burden is an item which must be taken into consideration in determining the rate of duty. With every increase in rate, increased national self-sufficiency is to be weighed against increasing cost.

In terms of money, the burden of the sugar duty upon taxpayers may be estimated at $216,000,000, or $1.97 per capita per annum. It will be shown (pp. 121–22) that, assuming conditions in demand to remain con-

stant, the normal long-run effect of a complete removal of the duty would be to reduce the New York price of raws by an amount equal to the duty. The change in the price of refined granulated brought about by a change in the duty is approximately the change in the price of raws multiplied by the factor 1.07535.[1] In so far as cost may be measured in terms of money, the burden of the sugar duty upon American consumers may, therefore, be shown in the form of a balance sheet (p. 99).

It will be seen that the duty on sugar imposes a burden of $216,500,000 upon consumers, of which $124,500,000 is available as revenue, the remainder ($92,000,000) being a burden assumed by the public for the purpose of protecting domestic producers. Reduced to a per capita basis, the above figures become $1.97, $1.13, and 84 cents respectively.

The real burden, however, is an unnecessary expenditure of human labor in securing a necessary article. The foregoing analysis follows the usual method of measuring the cost of a protective duty to consumers by an increase in price brought about by the duty multiplied by the quantity consumed. When only a single article is under consideration, this

[1] The manner of arriving at this factor is as follows: It takes about 1.07 pounds of raws to make 1 pound of granulated. Hence the duty, whatever it is, must be multiplied by 1.07 to find the increase in the price of refined sugar caused by this factor alone. But that product represents the amount of money tied up in duties on every pound of refined sugar produced. Interest should, therefore, be added from the time the duty is paid to the time the refined sugar is sold. Assuming this period to be one month, the figure in the text is obtained. (See, however, footnote, p. 105.)

UNITED STATES GOVERNMENT IN ACCOUNT FOR ONE YEAR WITH SUGAR CONSUMERS ON THE BASIS OF CONSUMPTION FIGURES FOR 1922 AND THE RATE OF DUTY PROVIDED IN THE ACT OF SEPTEMBER 22 OF THAT YEAR *

Dr.	*Cr.*	Disposition of tax	
		United States Treasury	Protection to domestic producers
	Pounds and source		
Tax levied upon consumers through the imposition of a duty increasing the price of the total of 11,407,778,000 pounds of sugar, refined basis, by the amount of 1.898 cents per pound,	6,474,880,000, Cuba	$122,893,222	
	83,700,000, full duty	1,588,626	
	611,456,000, domestic cane		$11,605,435
	2,010,688,000, domestic beet		38,162,858
	1,033,738,000, Hawaii		19,620,347
	10,608,000, Virgin Is.		201,340
	697,022,000, Porto Rico		13,229,478
	480,366,000, Philippine Is.		9,117,347
	5,320,000, other		100,973
	11,407,778,000	$124,481,848	$92,037,778
$216,519,626		$216,519,626	

* The imports for 1922 were, in fact, subject to duty at the rate of 1.6 cents per pound against Cuban sugar until September 22, 1922, and at the rate of 1.7648 cents per pound against the same sugars for the remainder of the year. It seemed better, for the purpose of illustration, to assume a full year under the latter rate. Moreover, as a considerable part of the imports are refined for reexport, such sugars imposing no burden upon the consumer, and as it is in the form of refined sugar that the ultimate consumer pays his tax, Willett & Gray's estimate for total consumption in terms of refined sugar was used instead of actual import figures. It was further assumed that the price of all refined sugar was increased by the tariff 1.898 cents per pound—the Fordney rate of 1.7648 cents per pound multiplied by the factor 1.07535 as explained above. Duties were, in fact, paid upon raw sugars of various polariscopic tests and at various rates. Hence, the above totals are merely an estimate, but, it is believed, an estimate close enough to the truth for the purposes of this discussion.

method, with the qualifications to be discussed in Chapter V (p. 119), is admissible. But it does not go to the heart of the matter and the effect upon prices brought about by a comprehensive revision of the tariff is too intricate to be explained by any such simple formula. The real burden of the sugar duty may be explained as follows: Cuba has vast areas of land better adapted, perhaps, than any other region in the world both with respect to soil and climate for the production of sugar. Nowhere can a considerable quantity of sugar be produced with less expenditure of human effort. There are, it is true, regions of domestic production where sugar can be produced with less effort than that indicated by the marginal cost in Cuba, but to produce any considerable proportion of the quantity required by the people of the United States calls for much greater human effort than would be required to produce that quantity in Cuba. On the other hand, there is a vast range of commodities which can be produced with less human effort in the United States than in Cuba. There will, therefore, be economy in human effort if the people of the United States devote themselves to the production of the commodities involving the least effort and exchange them directly or indirectly for Cuban sugar. In this way the people of the United States satisfy their sugar needs with less effort than when they produce the sugar themselves. To impose a protective tariff on sugars is to divert labor and capital from the channels of production yielding greater returns for the same expenditure to a channel yielding less. It is, in fact,

deliberately to forego the opportunity lying right at our doors of availing ourselves of the bounty of nature as manifested in the sugar lands of Cuba.

III. FOREIGN TARIFFS

Sugar duties are found in the tariffs of nearly all commercial nations. The only important exception is Holland, into which sugar is admitted free of duty. But even in Holland a certain measure of protection is granted to the domestic industry in the form of restrictions upon the sale of imported sugars for domestic consumption. Great Britain imposes a considerable duty upon sugar, the purpose, however, being revenue rather than protection. A small quantity of beet sugar, it is true, is domestically produced, but it has been the general policy to subject the domestic product to a considerable internal-revenue tax, so that the net protection is not great.[1]

Because of the present fluctuation in the value of many foreign currencies it is difficult accurately to compare foreign with American rates of duty in terms of American money. It is customary in such countries to fix a gold rate of duty and then to multiply this rate by a factor based on the depreciation of the currency to determine what the duty shall be when payment is made in paper. The rates given in Table X (p. 102) for a few leading countries may prove instructive.

[1] For one year the two beet-sugar factories in England have been relieved of the internal-revenue tax. This is equivalent to a bounty of nearly 5 cents per pound—a high measure of protection while the remission of excise continues.—*Willett & Gray, p. 38, Jan. 18, 1923.*

TABLE X.—Rates of Duty, Reduced to Cents per Pound at Rates of Exchange, August 1, 1922, upon Raw Sugar of a Grade Comparable to 96° Centrifugals *

Country	Expressed in		
	Currency and weights of foreign country	Cents per pound U. S. currency	
		At par	At rate of exchange, Aug. 1, 1922
Argentina	0.045 peso per kilo	2.4100	1.8500
Australia	6 shillings per 112 pounds	1.3000	1.1900
Belgium	40 francs per 100 kilos, net	3.5000	1.4070
Brazil	2.668 milreis per kilo [a]	6.6100	17.6400
Canada	$1.68712 per 100 pounds	1.6800	1.6800
Czecho-Slovakia	26 crowns per 100 kilos	2.3900	2.2800
Denmark	0.065 crown per kilo	0.7900	0.6300
France	50+19.5 francs per 100 kilos.	8.6400	2.5700
Germany	40 gold marks per 100 kilos.	4.3200	3.1200
Greece	68.965 drachmas per 100 okes	3.3400	2.0040
Hungary	2.080 (paper) crowns per 100 kilos	191.5300	0.4680
Italy	24 lire per 100 kilos	2.1000 [b]	2.1000 [b]
Japan	3.35 yen per kin	1.2600	1.2100
Mexico	0.15 peso per gross kilo	3.3900	3.3200
Netherlands	Free (Excise 0.225 florin per 100 kilos)	0.0410	0.0390
Spain	180 pesetas per 100 kilos	15.7500	12.6000
Sweden	107 crowns per kilo	0.8500	0.8300
United Kingdom	£1 2s. 4.5d. per 112 pounds	4.8000	4.4400
United States	1.7648 cents per pound [c]	1.7648 [c]	1.7648 [c]

* Data from photostat sheets prepared by Foreign Tariffs Division, Department of Commerce.

[a] The Brazilian rate has been increased since August, 1922, to 3.318 milreis per kilo, which reduces to 20.49 cents per pound at the time the change was made.

[b] In Italy, whatever the rate of exchange, payments are virtually made in gold. Sufficient paper is required to equal a gold payment.

[c] 1.7648 cents per pound is the rate on 96° centrifugals from Cuba. The full duty on the same grade is 2.206 cents per pound.

It will be seen from the above table that sugar is a commodity selected by many countries as an article suitable to be assessed for duty, either for purposes of revenue or protection. Two sugar-producing countries, Brazil and Spain, impose rates which would appear to be prohibitory. If we omit these from consideration, it will be seen that the rate at present imposed by the United States on Cuban sugar (1.7648 cents per pound) is not far from the average of all the others (1.821 cents per pound).

CHAPTER V

EXTENT TO WHICH THE DOMESTIC INDUSTRY IS DEPENDENT ON THE TARIFF

It has been shown in the preceding chapters that the United States is consuming a large and increasing quantity of sugar. In 1922 the consumption exceeded 5,500,000 tons, of which somewhat over half was imported from Cuba. Because of the Cuban preference, the quantity imported from other foreign sources except for reexport is usually negligible. The rest is obtained from domestic sources—cane sugar from Louisiana and Texas, Porto Rico, and the Hawaiian, Philippine, and Virgin islands and beet sugar from some sixteen States. The Philippine Islands ship a portion of their output to countries other than the United States.[1] With this exception virtually no sugar of domestic production, either in the raw or refined stage, is exported. A considerable business, however, is done by the refineries in importing raw sugar, refining it, and then exporting the refined sugar with benefit of drawback. (See p. 78.) The domestic product now receives, and, indeed, always has received, a considerable degree of protection. It is the purpose of this chapter to inquire to what extent this protec-

[1] This portion varies greatly from year to year. In 1922 it was about one-third of the total output and in 1923 only one-sixth.

tion is necessary for the maintenance of the industry. The subject will be discussed under four heads: I. The sugar-refining industry and protection. II. Differences in cost and marginal cost and their relation to the tariff. III. The effect of tariff changes on marginal costs. IV. Adequate protection for domestic producers.

I. THE SUGAR-REFINING INDUSTRY AND PROTECTION

So far as the refiners are concerned it may confidently be asserted that protection is unnecessary. All recent acts have given a certain amount of "net" [1] protection on refined sugar. But since the

[1] Net protection may be defined as the duty on a finished product over and above the duty which is just sufficient to compensate the manufacturer for the added cost caused by a duty on his raw materials. The present duty on Cuban 96° centrifugals is 1.7648 cents per pound. It takes about 1.07 pounds of such sugar to produce 1 pound of refined sugar. Hence, because of the duty on raw sugar, the refiner's cost of producing a pound of refined sugar is at once increased about 1.89 cents per pound. To this must be added the interest charge on the amount of the duty from the time the duty is paid to the time the sugar is sold. Assuming this period to be about one month, the total added cost due to the duty would be about 1.9 cents per pound. This estimate of added cost is based upon the duty on Cuban raw sugar. As Cuba does not refine sugar for export, an American importer of refined sugar would have to pay the full duty, which is 2.39 cents per pound. Hence, the refiner's net protection is 0.49 of a cent per pound. Were Cuba a refined-sugar-exporting country, the net protection would be 0.012 of a cent per pound. The net protection is, in fact, somewhat greater than the figures just given. This estimate was based on the supposition that, of the 107 pounds of raw sugar required to produce 100 pounds of refined sugar, the 7-pound excess was a total loss. Such is not the case. The refineries, in addition to sugar, produce

refiners, even under the handicap of being obliged to tie up considerable capital in duties on raw sugar between the date of importation and that of exportation of the same sugars after being refined, are nevertheless able to do a large and increasing export business, it is clear that the protection is purely nominal. They are in no wise dependent upon the tariff. Indeed, because of the capital tied up in duties and the fact that the drawback is 1 per cent less than the duty paid, they would be better off if sugar duties both on raw and refined sugars were repealed.

II. DIFFERENCES IN COST AND MARGINAL COST AND THEIR RELATION TO THE TARIFF

A domestic producer's need for protection may be defined as the difference between his cost of production, including a reasonable profit, and the price at which foreign sugar of the same grade would sell in the American market if there were no duty. Now, it is popularly supposed that under the action of competition the price at which an article sells will tend to settle at its cost of production; and it is further supposed that there is one foreign cost of production and one American cost of production. If the foreign cost of production is less than the American cost of production it is supposed that competition will tend to reduce the price to the for-

for the market considerable quantities of sirup, the receipts for which reimburse them in part for this loss. Moreover, as shown later (p. 119), the increase in price caused by the duty is not necessarily the full amount of the duty.

eign cost and that hence, if the American producer is to be able to compete, the foreign cost must be artificially increased by a protective duty to an extent sufficient to make it equal to the American cost. It was on this principle that the present tariff was to be made "flexible." The President was authorized to change the rates provided in the act so as to "equalize the costs of production" between the American producer and his chief foreign competitor. Unfortunately for tariff makers, the case is not so simple.

Costs of production vary greatly among the individual producers. Many, if not all, commodities have no single foreign cost of production and no single American cost of production. Such is preeminently the case with sugar. Data secured by the United States Tariff Commission from individual factories in all the regions of domestic production and in Cuba show virtually as many different costs as factories. The accompanying chart (fig. 1) shows these costs arranged in order, beginning with the lowest, for each of the several regions.

The diagram for each region consists of a series of rectangles placed side by side so that the lower bases of all form a continuous line. Each of these bases is drawn proportional to the output of a single factory or a group of factories under the same management, and the altitude of each is drawn proportional to the cost of production per pound of sugar for the same factory or group of factories.[1]

[1] "Cost of production," as used by the Tariff Commission in the construction of these diagrams, includes the cost of raw material

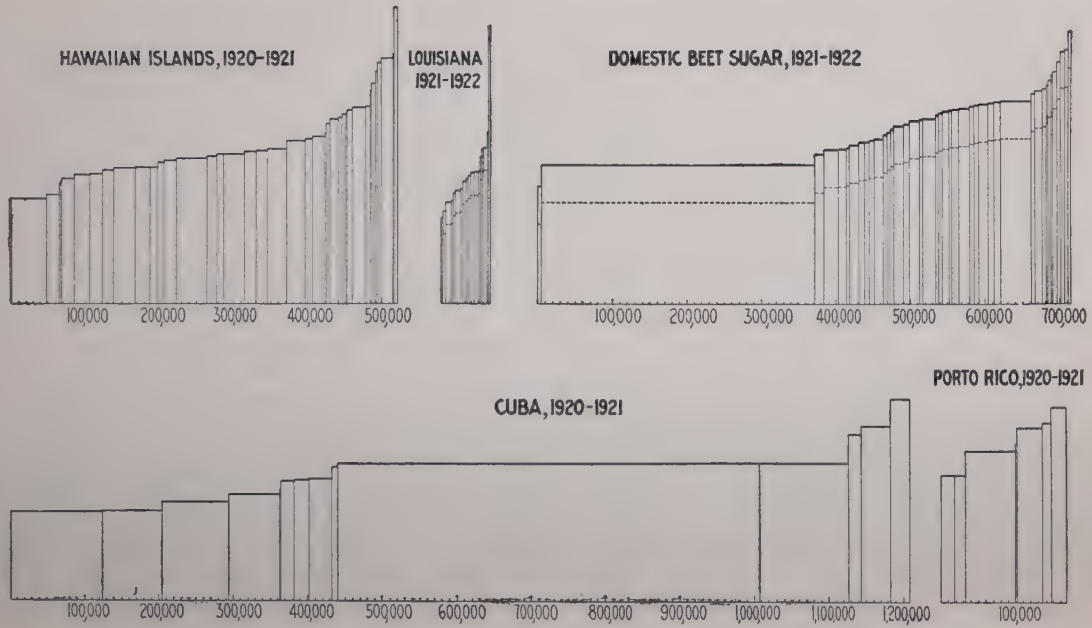


FIGURE 1.—OUTPUT AND COST OF PRODUCTION, FACTORY BY FACTORY, IN THE SUGAR INDUSTRY FOR THE YEARS AND REGIONS SPECIFIED.

Three things stand out conspicuously in the diagram: (1) The costs of production differ greatly as between factories. (2) The smaller factories tend to group themselves at the high-cost end and the larger factories at the low-cost end. (3) While there are many costs in Cuba and many costs in each of the other regions, the costs in all the domestic regions start at a higher level than the lowest cost in Cuba and terminate at a higher level than the highest cost in Cuba. Though some factories in Cuba produce at higher cost than some factories in each of the domestic regions, nevertheless it is fairly obvious to the eye that sugar production in Cuba is on a lower range of costs than in the domestic regions.

In making cost comparisons raw and refined sugar should be reduced to a common basis. Before attaching any importance to the last observation one important qualification must be made. Cuban, Porto Rico, and Hawaiian sugars are all raw sugars, and so is much of the sugar produced in Louisiana. But all of the beet sugar is refined; and much of the sugar produced in Lousiana, if not refined, is at least of a higher grade than raw sugar. Some of the Louisiana sugar is, indeed, refined granulated. Before just cost comparisons can be made these different grades of sugar must be reduced to a common basis. The distances from the base line to the dotted line shown in the diagrams (fig. 1) for

(cane or beets), conversion costs, and overhead, depreciation, and marketing costs, from which total are deducted the receipts for by-products. It includes State taxes but not Federal taxes, profits, nor interest on investment.

domestic beet and Louisiana are an estimate of the costs of producing beet sugar and Louisiana sugar when reduced to a raw basis.

The differences in cost among individual producers is permanent. Returning to the first observation made from the diagram, the question arises whether these striking differences in costs among individual producers in the same region are to be regarded as permanent or as merely temporary aberrations brought about, perhaps, by the war.

That they were not merely temporary results of the war may be shown by similar diagrams for pre-war years. Figure 2 shows costs for the same regions as those shown in figure 1 for a pre-war period.[1] From this diagram, disparity of costs among individual producers in the same region is seen to be as marked a characteristic of a pre-war year as it was of the post-war year shown in figure 1.

In agricultural and some other industries, where land or other natural resources play an important part, differences in cost have long been recognized in all economic treatises as normal. As the demand for a product increases with the growth of population, the quantity which can be produced on the most fertile or best-located land is found to be insufficient. The scarcity thus brought about causes the price to rise, and as the price rises it becomes profitable to cultivate less fertile or less favorably located land. Such land will yield the product under question only at a higher cost. Hence, in

[1] Costs of Production in the Sugar Industry: U. S. Tariff Com. Tariff Information Ser. 9, Appendix B, 1919.

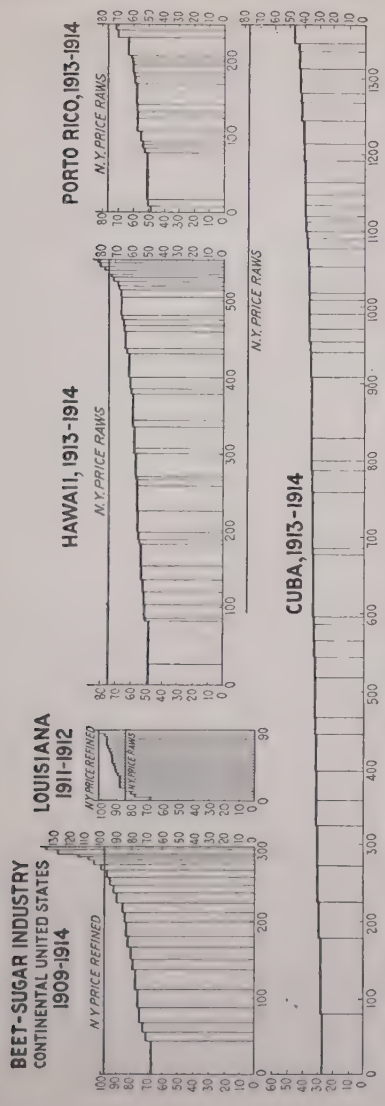


FIGURE 2.—PRE-WAR OUTPUT AND COST OF PRODUCTION, FACTORY BY FACTORY, IN THE REGIONS SPECIFIED.
Costs of Production in the Sugar Industry: U. S. Tariff Commission Tariff Information Series 9, 1919.

such industries, as time goes on, the tendency will be to increase the disparity in costs among individual producers. As sugar is predominantly an agricultural industry, the case for permanence in the differences of costs might be dismissed at this point.

But even in the case of purely manufacturing industries, in which, as is popularly supposed, there are forces tending to reduce the costs among competing producers to a level, it is doubtful whether such a result is, in fact, ever even approximately attained. No industry could be of a more purely manufacturing character than that of refining sugar, yet data secured by the Tariff Commission for the years 1914–19 show differences in cost hardly less extreme than those shown in the preceding diagrams (figs. 1 and 2) for the more agricultural phase of the industry.[1]

The line of reasoning that is popularly supposed to demonstrate a tendency to uniformity of costs among competing producers in manufacturing industries runs somewhat as follows: Low-cost producers competing for increased profits will enlarge their output; competition to dispose of the increasing output will reduce the price, and all producers whose cost is higher than this price will be put out of business; hence costs will constantly gravitate toward the lowest and ultimately settle there.

Doubtless such selective tendency is at work; but other economic forces, the normal operation of which is to counteract this tendency and bring

[1] Refined Sugar: U. S. Tariff Com. Tariff Information Ser. 16, p. 28, fig. 3, 1920.

about a disparity, are also at work. The above reasoning supposes that the lowest-cost producers can or will increase their output to a point where competition among buyers will not bid up the price above that lowest cost of production. Until this result is attained, higher cost producers will be able to survive. But the economic forces of discovery, invention, and improvement in organization are constantly at work, tending to reduce cost. The new methods are adopted first by one competitor and then by another; and sufficient time between such applications of improved methods never, in fact, elapses to permit any group of "lowest cost producers" to increase their output sufficiently to drive their competitors out of business. Moreover, at the other end, a strong and increasing demand by consumers is always tending to raise the price and thereby permit some of the less effective producers to survive. In short, the argument for uniformity of costs supposes a static condition of industry which does not exist and probably never will. At all events, whatever may be true in other industries, there is every indication that in the sugar industry disparity in costs will continue in both the agricultural and manufacturing phases.

The producer who just "breaks even" from year to year may be called the marginal producer. Though competition, as has been shown, does not fix a uniform cost, it does tend to fix an approximately uniform price. Data collected by the Tariff Commission show that, while there is some difference in the prices at which individual sugar producers dis-

pose of their product, these differences are small compared with the differences in costs, and that, at any rate, there is no necessary relation between the *cost* and *price* for any individual producer. The low-cost producers are as likely to get a high price as the high-cost producers. This being true, it is clear that the producers shown in the diagrams (figs. 1 and 2) make successively less and less profit in inverse proportion to their costs, that is, as they are located farther and farther from the left-hand side. Proceeding in this way a producer is eventually reached who just manages to "break even." His cost of producing a pound of sugar is just equal to the price he receives for a pound of sugar. Such a producer may be called the "marginal producer" and his cost the "marginal cost."

A few producers every year operate at a loss and these may be called "extramarginal" producers. If economic law worked with mathematical precision, the marginal producer would always be the highest-cost producer, the producer literally at the right-hand *margin* of the diagram. In practice, this is seldom true. Data collected from the sugar industry show that in any given year a few producers show a cost higher than the marginal. That is, they produce at a loss. This "extramarginal" fringe is made up of producers who are in process of elimination or of producers who are suffering from a temporary reverse. The high cost of this year may be offset by a low cost next year. The existence of such a fringe of high-cost producers does not, however, affect the reasoning just given.

The price determined by "supply and demand" in a dominant market fixes the price in all local markets. The price of a commodity is said to be determined by the forces of supply and demand. But in the case of commodities entering largely into interstate or international trade the local price is seldom determined by the local supply and demand. There is usually some dominant market in which the supply and demand over wide regions of territory are brought to a focus. The large-scale buying and selling operations and the speculation in futures determine the price in this dominant market; and this price, after making allowance for freight differentials, is accepted as the price in all the local markets.

New York is the dominant sugar market; prices in all markets throughout the United States are fixed by the New York price. In New York, sales for both present and future delivery are based on dealers' estimates of supply and demand, and the price so determined becomes at once, after making allowance for costs of transportation from New York, the price in Chicago, Denver, San Francisco, and other centers.[1] The price determined by New

[1] A well-established trade practice fixes the price of beet sugar at a figure somewhat lower than that of cane sugar in the same market. In 1917 the price differentials between cane and beet sugar in typical markets were as follows in fractions of a cent per pound: Detroit, 0.446; Chicago, 0.203; Pittsburgh, 0.168; San Francisco, 0.147; Denver, 0.188; Kansas City, 0.182. The basis of this discrimination is partly an unwarranted prejudice in favor of cane sugar. But the chief reason is found in the fact that beet sugar is manufactured only in the form of refined granulated, while cane sugar is manufactured in many forms—granulated, powdered,

York dealers is based upon estimates of output and consumption from all regions. Hence the price in any one region is not directly determined by the conditions of supply and demand in that region. Nevertheless, the conditions of supply and demand in that region contribute indirectly to the price in that as well as other regions. For example, a large beet-sugar crop in Colorado does not directly affect the price of beet sugar in Denver; but it is one of the factors influencing the judgment of New York dealers and hence is contributory to the New York price, which ultimately determines the price of sugar in Denver.

New York Quotations Explained.—The most important New York quotations are for: (1) 96° centrifugals c. and f., (2) 96° centrifugals duty paid, and (3) refined granulated.

1. Sugar manufactured by the modern process, in which the crystals are separated from the "masse-cuite" by means of the centrifugal machine, tests not far from 96° by the polariscope. Muscovado sugars test lower; but the price of 96° sugars is the basic price from which the price of all other raw sugars is estimated in accordance with a sliding scale. The c. and f. (costs and freight) price of such sugars is the price landed in New York before the duty is paid. It includes the price paid the foreign exporter, together with all transportation costs to New York, but not the duty.

2. The duty-paid price, in addition to the items

crystals, etc. A dealer in sugars prefers to place his order with a concern which can deliver all the varieties that his business requires.

contributing to the c. and f. price, includes also the duty. Hence c. and f. quotations from day to day differ from duty-paid quotations by virtually the amount of the duty.

3. The quotations of refined granulated are the prices at which this grade of sugar is sold to the trade by the refineries.

All of the above prices are, by trade custom, subject to a 2 per cent cash discount.

Long-run economic forces always tend to equalize the marginal cost and the price. The marginal cost must not be conceived as a fixed and unchangeable quantity. Under the play of economic forces it changes from year to year. For example, a strengthening of demand, due to increase in population or increasing per capita consumption, will tend to raise the price. At the increased price, producers, who before could produce only at a loss, may be able to "break even" and hence to establish a new marginal cost at a higher level. On the other hand, improvements or the opening of new regions may increase the output and hence lower the price. At the lower price, producers who before were just able to "break even" will find that they are producing at a loss and will be forced out, thus establishing a new marginal cost at a lower level. It will thus be seen that increasing demand is an economic force tending, first, to raise price and, later, marginal cost, and that discovery and invention are economic forces tending, first, to lower price and, later, marginal cost. A reciprocal action also sets in in each case. As marginal cost rises

under the influence of increasing demand the output also increases, thus tending to lower price; and as the marginal cost falls, under the influence of improved methods, the forcing out of former marginal producers tends to decrease output and hence raise the price. The point of this reasoning is that, while in a dynamic society marginal cost and price may differ, there are nevertheless long-run economic forces tending to draw them together, and hence the average price for a series of normal years may be taken as perhaps the best measure of the average marginal cost for those years.

Marginal cost in the case of sugar may refer to the New York market or to the region in which the sugar is produced. In a given region the several competing establishments incur certain costs up to the time the sugar is ready for delivery at the factory. Among these costs there will be a marginal cost, which may be called the "marginal cost, f.o.b. factory," for that region. Before the sugar is delivered in New York other costs are incurred—costs of transportation and, if the sugar is of foreign origin, the duty. The sum of these costs may be added to the f.o.b. factory costs for each region, and among the totals will be found a marginal cost for each region. This may be called the "marginal cost, New York," for each region.

Long-run economic forces tend to reduce to equality "marginal costs, New York," for all regions supplying the New York market. All regions supplying the New York market must sell in that market at the New York price. As the marginal costs, New York,

from all such regions tend to become equal to the New York price, they must tend to become equal to each other. The same reasoning will apply to the marginal costs, Chicago, Detroit, Denver, San Francisco, or any other market with respect to the regions whose sugars compete in that market. For example, assuming that Cuban and Michigan sugars compete in the Chicago market, then the marginal cost, f.o.b. factory, Cuba, plus transportation to New York, plus the duty, plus the marginal cost of refining, plus transportation to Chicago, minus the differential between cane and beet sugar will tend to equal the marginal cost, f.o.b. factory, Michigan, plus transportation to Chicago.

III. THE EFFECT OF TARIFF CHANGES ON MARGINAL COSTS

An increase in duty tends to bring about an increase in the domestic marginal cost, f.o.b. factory, and a decrease in the Cuban marginal cost, f.o.b. factory, and vice versa. Suppose that the duty upon sugar is increased. Since the immediate determinant of price is the interaction of supply and demand in the New York market, and since a change in the tariff does not immediately change either the supply or the demand,[1] the change in the tariff should not normally have any *immediate* effect upon the New

[1] This is on the assumption that even after the increase in duty, New York continues the most favorable market for Cuban sugars. If Cuba can find a more favorable market, the supply offered in New York under the increased duty will be decreased and the price will at once rise.

York price. Hence, in order to sell in New York over the increased duty the Cubans will be obliged to reduce their f.o.b. factory price. At this lowered price the former Cuban marginal producers will be unable to survive, and their elimination will reduce the output and somewhat improve the price in New York as well as in Cuba. The improved New York price will then make it profitable for domestic producers to produce sugar at a cost somewhat higher than the former domestic marginal cost, thus increasing the domestic output and retarding the rise in price brought about by the falling off of importations from Cuba. A new equilibrium will eventually be brought about with the marginal costs, New York, equal for domestic and Cuban producers, but with the marginal cost, f.o.b. factory, Cuba, differing from the marginal cost, f.o.b. factory, in each domestic region whose price is determined by the New York price by an amount greater than it was before by the increase in duty. When this equilibrium is attained, the marginal cost, f.o.b. factory, Cuba, will be somewhat lower than it was before the change in duty and the domestic marginal costs in each region will be somewhat higher than before the change in duty.

The reasoning in case the duty is reduced can be so easily derived from that just given where the duty is increased that any further exposition would be superfluous.

To sum up, the normal long-run effect of an increase in the duty is to raise the marginal cost, f.o.b. factory, in all regions of domestic production

and to lower the marginal cost, f.o.b. factory, in Cuba, to raise the New York price by an amount somewhat less than the increase in duty, and to increase the proportion of total domestic consumption derived from domestic sources. The normal long-run effect of a decrease in the rate of duty is to lower the marginal cost, f.o.b. factory, in all regions of domestic production and to raise the marginal cost, f.o.b. factory, in Cuba, to lower the New York price by an amount somewhat less than the decrease in duty, and to decrease the proportion of total domestic consumption derived from domestic sources.

If the duty is so reduced as to admit large quantities of sugars from foreign countries other than Cuba, the resulting reduction in price will closely approximate the reduction in duty. The conclusion of the last paragraph, that a reduction in duty would tend to "lower the New York price by an amount somewhat less than the decrease in duty," was based on the assumption that foreign importations came exclusively from Cuba. At present this is practically the case and, so long as the Cuban preference remains at anything like its present magnitude, the virtual exclusion of other foreign sugars will continue, a reduction in duty will tend to raise the Cuban marginal cost, f.o.b. factory, and hence the reduction in the New York price will be less than the reduction in duty.

But as the duty is reduced, the Cuban preference of 20 per cent becomes less and less a barrier to the admission of other foreign sugars and disappears entirely when sugar is admitted free of duty. When

the reduction becomes so great that imports of other foreign sugars arrive in large quantities, "world marginal cost" must be substituted for Cuban marginal cost in the above reasoning. With so large a reservoir to draw from, the reduction in the American tariff will have little effect in raising the world marginal cost. Hence, the reduction in New York price should be practically as great as the reduction in duty instead of less than that reduction.[1]

The rate of duty that will "equalize costs of production" is indeterminate. Under Section 315 of the Tariff Act of 1922 the President is authorized within certain limits to modify the rates of duty provided in that act to such an extent that the rate imposed shall equalize the difference in cost of production between the domestic producer and his chief foreign competitor.

Since sugar is produced at many different costs in all regions of production, both foreign and domestic, it becomes necessary to make some selection among

[1] An illustration may assist the reader in following the above reasoning. Assume a New York price of 6.13 cents, made up as follows: 4.17 cents (Cuban marginal cost)+0.2 of a cent (freight to New York)+1.76 cents (duty). Now suppose duty removed. Case 1: Importations solely from Cuba and Cuban marginal cost increased 0.5 of a cent because of increased production. The New York price becomes 4.87 cents made up as follows: 4.67 cents (Cuban marginal cost)+0.2 of a cent (freight). Reduction in New York price, 6.13 cents−4.87 cents=1.26 cents (a reduction less than the reduction in duty). Case 2: Importations from all sugar-producing regions and world marginal cost unaffected by change in duty. The New York price becomes 4.37 cents, made up as follows: 4.17 cents (world marginal cost)+0.2 cent (freight). Reduction in New York price, 6.13 cents−4.37 cents=1.76 cents, a reduction equal to the reduction in duty.

the numerous domestic costs and the numerous foreign costs in order to find a difference between *the* domestic cost and *the* foreign cost which shall fix the duty that is to equalize these costs. Clearly, if the lowest foreign cost and the highest domestic cost were selected, the equalizing duty would be very great; and if the highest foreign cost and the lowest domestic cost were selected, no duty whatever would be required. Indeed, in the latter case it would be necessary to impose a tax on the domestic product in order to "equalize costs." Clearly, either of these selections is impracticable. The most promising selections for this purpose are those based on: (1) marginal costs or (2) average costs.

Marginal Costs.—It has been shown that marginal costs in all regions contributing to the domestic supply tend to adjust themselves to changes in the tariff and that when the adjustment has been made, the marginal costs, New York, from all these regions will be the same,[1] while the marginal cost, f.o.b. factory, Cuba, will, after allowing for freight differentials, differ from the marginal cost, f.o.b. factory, in each of the domestic regions of production, by precisely the amount of the tariff. Hence, if a cost study be made when a sufficient number of years

[1] It may take a considerable number of normal years to effect this adjustment. Actual marginal costs recently collected by the Tariff Commission from the several regions of domestic production show a marked disparity. Some are perhaps higher and others lower than the level to which they will ultimately settle. After making proper allowance for transportation charges, an average of such marginal costs may be assumed to be *the* domestic marginal cost.

have elapsed after the passage of a tariff act to effect the above adjustment, the rate of duty, whatever it is, will be found just sufficient to equalize marginal costs and protect the domestic marginal producer and all other domestic producers whose costs are less than the marginal.

However, as it takes some years to effect this adjustment of marginal costs, if the cost study be made immediately after an increase in duty the new rate will be found to be greater than is necessary to equalize marginal costs, whereas if the cost study be made immediately after a reduction in duty the new rate will be found to be insufficient to equalize marginal costs.

Since, after a lapse of years, any rate whatever will be found just sufficient to equalize marginal costs, *the* rate which will equalize marginal costs may be said to be indeterminate.

Average Costs.—It has been shown that marginal costs, f.o.b. factory, tend, after allowing for freight differentials, to become equal in all regions of domestic production. But, starting at this point, the other costs may run downward to a much lower level in some regions than in others. Hence, the average costs in the several regions are not necessarily equal. Therefore, if the duty is to be adjusted so as to equalize average costs, it will make a difference whether it is the average from all domestic producers in all regions lumped together or the average from any one specific region which is to be compared with the Cuban average in order to find the equalizing rate. Both in Cuba and in all regions

of domestic production the average cost is much lower than the marginal cost, but the difference between the Cuban and domestic averages is not necessarily very different from the difference between the Cuban and domestic marginal costs. In general the duty which equalizes average costs is greater or less than the duty which equalizes marginal costs in proportion as the range of costs in the domestic industry is less or greater than the range in the Cuban industry.

Average costs, like marginal costs, tend to rise in all regions of domestic production and fall in Cuba after an increase in the duty, and to fall in all regions of domestic production and rise in Cuba after a decrease in the duty. But the adjustment is by no means perfect. Even after a lapse of years following an increase in the duty the new rate may not be found to equalize costs as determined by the method of averages. Moreover, the rate which will equalize average costs is not necessarily indeterminate.

The subject of differences in cost, marginal cost, and their relation to the tariff is somewhat difficult. A mathematical treatment, with diagrams, is given in Appendix D (pp. 276-284).

The above conclusions relate to tendencies which in any concrete case may be obscured by other factors. It must be distinctly understood that the above conclusions are based on the supposition that "other things are equal," that is, that no changes are made in the sugar situation except the change in the tariff. If other changes occur, as for example changes in

the American demand, the opening of new fields, discovery of new processes, changes in the purchasing power of money, or in other important factors the above conclusion will have to be modified. But whatever the other changes, a change in the tariff will have a *tendency* in the direction indicated, though its operation may be obscured by the changes in the other factors. It was stated, for example, that an increase in the rate of duty tended to increase the New York price, yet it would be unsafe to assert that the New York price will actually be higher because of the increase in duty brought about by the acts of 1921 and 1922. The influx of American capital and American enterprise into Cuba and the opening of new fields in its eastern end may result in such an increase in output from Cuba at a cost lower than the present marginal cost that the New York price, even after paying the increased duty, will be lower than before. Yet it may be stated that the price even then will not be so low as it would have been had the duty not been raised.

Again, it was stated that an increase in the rate of duty would tend to increase the proportion of the total United States consumption derived from domestic sources. A notable strengthening of the United States demand or a lowering of the Cuban marginal cost due to the opening of new and more productive regions in Cuba, might, however, so obscure this tendency that, even after the increase in duty, the proportion of Cuban sugars in United States consumption might increase. But the

increase in importations would not be so great as it would have been had there been no increase in duty.

Finally, all of the above conclusions are developed on the theory of free competition at all stages of the process. A monopoly or partial monopoly among domestic or foreign producers might modify greatly any of the results set down. (See pp. 229–235.)

A decrease in the purchasing power of money decreases the protection implied in a fixed specific rate. A factor just now of great importance in obscuring the effect of tariff changes is the changing value of money. Since the passage of the Act of 1913 the purchasing power of the dollar has greatly declined. Bureau of Labor index numbers for wholesale prices of "all commodities," taking the 1913 index as 100, have since that year been as follows: 1914, 98; 1915, 101; 1916, 127; 1917, 177; 1918, 194; 1919, 206; 1920, 226; 1921, 147; 1922, 149.[1] A recent estimate by Professor Fisher (August 5, 1923) places the purchasing power of the dollar at 65.4 cents as compared with its pre-war value. This would correspond with an index number of 153.

Changes in the purchasing power of money become of especial importance, so far as their bearing on the tariff is concerned, in connection with specific duties. When the dollar falls in purchasing power to an extent indicated by a rise in index numbers from 100 to 150, this means that, in so far as index numbers are representative of conditions in all industries, costs of production as measured in money have

[1] Wholesale Prices, 1890–1922: U. S. Bur. Labor Statistics, p. 9, 1923.

increased in the same ratio. Assuming that the change in the purchasing power of money is the only change, competition would tend to keep all individuals and all classes of the community in the same relative position to one another. In order that this condition should be realized, it would be necessary that money incomes of all sorts should change in the same ratio as prices, and, therefore, the money outlay of every establishment for wages, materials, and other items incident to production cost should also change in the same ratio. Hence, if this change in the purchasing power of money is international, it would be necessary, in order to maintain the domestic and foreign producers in the same relative position to one another, to change a *specific* duty in the same ratio as the change in index numbers.

The duty on Cuban 96° centrifugals under the Act of 1913 was about 1 cent per pound, the Cuban marginal cost, c. and f. New York, was about 2.8 cents per pound, and the marginal cost in the several regions of domestic production was about 3.8 cents per pound after making proper allowance for transportation charges. The rate of 1 cent, therefore, was sufficient to maintain all domestic establishments whose costs did not exceed 3.8 cents per pound. Other things being equal, the costs of all Cuban and domestic establishments should now be increased in about the ratio of 1.5 to 1. Hence the Cuban marginal cost should now be 4.2 cents per pound and the domestic marginal cost 5.7 cents per pound. Hence the rate which would be required to

maintain the same domestic establishments that were formerly maintained at the rate of 1 cent per pound would now be 1.5 cents per pound (5.7−4.2).

The tendency of marginal costs to adjust themselves to the duty tends, during a period of general rising prices, to lessen the protection implied in a fixed specific rate. It has just been shown that a lowering of the purchasing power of money, indicated by a period of rising prices, calls for an increase in specific duties if the same degree of protection is to be maintained. It has also been shown (p. 117) that, whatever the duty, the difference between the foreign and domestic marginal cost tends to adjust itself to that rate. If, therefore, at the beginning of a period of rising prices a commodity is subject to a fixed specific duty, then when sufficient time has elapsed to effect an adjustment the difference between marginal costs will still be the fixed specific rate, while the rate which would afford the former protection should be higher by a ratio equal to the ratio of the later and earlier index numbers. That is, a lowering of the purchasing power of money tends to act in the same manner as a lowering of the rate for commodities subject to a specific duty.

The above paragraphs apply only to specific duties. The protection granted under a given ad valorem rate automatically adjusts itself to changes in the purchasing power of money. In the example just given, if the rate in 1913 instead of being 1 cent per pound (the price being 2.8 cents per pound) had been the ad valorem equivalent, 35.72 per cent, then when the Cuban marginal cost and price rose to 4.2

cents per pound because of the decrease in the purchasing power of money, the same ad valorem rate of duty would show a specific equivalent of 1.5 cents per pound—the result arrived at on page 129.

IV. ADEQUATE PROTECTION FOR DOMESTIC PRODUCERS

If full data from Cuba can be obtained the duty which will be adequate to protect any specific American producer can be easily determined. The cost of production, f.o.b. factory, for this producer must first be ascertained; then the Cuban marginal cost, f.o.b. Cuba; then the transportation costs from Cuba and from the domestic producer to a competitive market. If the domestic producer in question is a producer of beet sugar, then the cost of refining and the conventional difference between the prices of cane and beet sugar must also be taken into consideration. With these data obtained, the process would be as follows:

Assume that the given domestic factory is in Michigan and that the common market is Chicago. Add to the Cuban marginal cost the transportation charges on raw sugar from Cuba to New York, the refiner's margin,[1] and the transportation charges on the refined sugar from New York to Chicago, and from the result subtract the customary Chicago differential in price between cane and beet sugar.

[1] The difference between the New York duty-paid price of 96° centrifugals and the New York price of refined granulated. These data may be obtained from trade publications, and the refiner's margin so obtained closely approximates the marginal cost of refining.

This final result, subtracted from the sum of the Michigan producer's cost of production and transportation charges from his factory to Chicago, will give the duty adequate to protect the Michigan producer. In normal times this difference will approximate the difference between the cost of his sugar laid down in Chicago and the average price of beet sugar in Chicago.

Adequate protection for the industry as a whole can be determined only when it has been previously determined what proportion of the total supply should be of domestic production. Since domestic and Cuban marginal costs, f.o.b. factory, adapt themselves to changes in the tariff, the problem now before the Tariff Commission of adjusting the rate so as to equalize costs of production is, strictly speaking, indeterminate. Any rate of duty will after a lapse of years be found to equalize costs, if marginal costs are used. The adjustment is not so perfect in the case of average costs, but even there the difficulty is similar. Suppose, as a result of a cost study, foreign and domestic average costs are obtained and a rate is imposed which will equalize them; the imposition of this rate will in time result in a change in the foreign and domestic averages and will no longer equalize them. Moreover, if average costs are used, there is the further problem of deciding whether the rate selected shall equalize the Cuban average with the average for the domestic industry as a whole or with the least favored region of the domestic industry.

Under any duty from zero up to a prohibitory

rate there will be a domestic industry and there will be imported sugars. Any rate, therefore, is adequate to protect *a* domestic industry, but the higher the rate the greater will be the proportion of the total domestic consumption that is of domestic origin.

The question before the tariff maker, therefore, is not that of legislating for the extinction or survival of the domestic industry as a whole, but of determining how large the domestic industry shall be. By increasing the duty he increases the proportion of domestic sugar, but he also raises the domestic marginal cost. That is, he invites into the field more and more ineffective producers, raises the price, and increases the burden upon consumers by a tax that goes largely as a gratuity (in the form of an increased profit) to low-cost domestic producers, who could survive under a lower rate of duty. His problem, in a nutshell, may be said to be to decide how great a degree of ineffectiveness it is wise, in the interest of national self-sufficiency, to protect.

A considerable proportion of the domestic industry would survive, even if sugar were admitted free of duty. The statement that under *any* rate *a* domestic industry will survive is based on cost studies made by the Tariff Commission.[1] These studies were made to show what the effect upon the domestic industry would have been had the provision for the free admission of sugar after May 1, 1916 (originally included in the Act of 1913) gone into effect. The

[1] Costs of Production in the Sugar Industry: U. S. Tariff Com. Tariff Information Ser. 9, pp. 41–42, 1919.

conclusions reached by the commission were as follows:

The above computations must be accepted as approximations. It is not unlikely that under the stimulus of necessity many of the factories would have improved in efficiency. Moreover, in none of the regions were reports received from all of the factories. Data from the omitted factories might have somewhat changed the results. But, assuming the diagrams to be on the whole fairly typical of the industry in its several seats, it appears that the removal of the duty in 1916, had such removal been followed by a lowering of the marginal cost and hence of the price by the full amount of the duty and had normal times continued, would have resulted in the elimination of a considerable percentage of the domestic industry. Approximately 43.3 per cent of the production in Porto Rico; 48.6 per cent in Hawaii; little or none in Louisiana; and 56.8 per cent in the beet-sugar industry would have survived under free trade.

A similar computation [1] based on cost studies made for the crop year 1917–18 showed that the domestic industry had at that time somewhat improved in competitive strength as compared with Cuba.

Applying the method employed in the former case, it will be found that the proportions of the output which could now (1918) survive free sugar would be as follows: beet sugar, 82 per cent; Hawaii, 77.7 per cent; Louisiana, 11.9 per cent; Porto Rico, 63.9 per cent.

The Tariff Commission has recently (December 1, 1923) issued a report, the result of a most thorough and comprehensive investigation, in which average

[1] Ibid., p. 44.

costs of production in Cuba and regions of domestic production are tabulated and in which also are tables showing the percentage of output at progressively increasing costs. The report covers the years 1921 and 1922 for the Cuban, Porto Rican, and Hawaiian producers and the crop years 1921–22 and 1922–23 for the Louisiana and beet-sugar producers. From this report estimates may be made of the percentages of the domestic industry which could survive the free admission of sugar at the present time.

The average price of refined granulated for the year 1923 was 8.78 cents per pound and of raw sugar 7 cents per pound. Assuming that if the duty were removed the price of sugar would decline by the full amount of the duty (1.7648 cents per pound on raws and about 1.9 on refined), then the resulting prices would be 6.88 for refined and 5.24 for raws. At these prices the percentages of the domestic industry that could survive would be as follows: [1]

	1921–22	1922–23
Domestic beet, about	87.5	80.0
Louisiana, about	96.0	72.0
	1921	1922
Porto Rico	51	85
Hawaiian Islands	76.5	86

[1] This was the method used in computing the percentages for 1913 and 1918 quoted above. Because of the paucity of Cuban data collected the Cuban marginal cost was assumed to be equal to the price, f.o.b. mill—an assumption at that time substantially correct. At present the price is much above the marginal cost. The Tariff Commission's figures take no account of interest on investment as an element of cost. If this were included the percentages in the table would be somewhat reduced. On the other hand the removal

The commission's tables are reproduced in Appendix F (p. 286). In arriving at the percentages just given, the costs as given in the table are increased by the marketing costs before making the estimate.

Since, even with prices reduced by the full amount of the duty, some four-fifths of the domestic industry could survive, it is evident that at the present time domestic producers are making handsome profits.

The price received by Cuban producers f.o.b. mill during 1923 averaged about 4.85 cents per pound. In 1921, 82½ per cent of the crop, and in 1922 the entire crop was produced at a cost less than 4.85 cents per pound, the highest cost being 3.8 cents per pound. The average cost in 1921 was 3.88 cents and, in 1922, 2 cents per pound. It is evident that at present prices Cuban producers also are making handsome profits.

Such profits will in time tend to stimulate output and reduce the price. The normal limit of such a reduction in price should be based on the Cuban marginal cost of production. Previous studies indicate that the cost at which 90 per cent of the output is produced is approximately the marginal cost. On this assumption the Cuban marginal cost, f.o.b. mill, for the years 1921 and 1922 would be 3.86 cents per pound. Allowing for freight differentials (see p. 210) and using the average of two years given in the commission's tables, the percentages of the

of the duty would not be followed immediately by a reduction of price by a like amount. For some time the reduction would operate mainly in increasing the profits of the Cuban producers.

domestic industry that could survive free sugar would be approximately:

	Per cent
Domestic beet sugar	66
Hawaiian cane sugar	40
Porto Rican cane sugar	30
Louisiana cane sugar	42

The first question for the body framing a sugar tariff is one of policy. It must decide what proportion of the total domestic consumption should, in the interest of a wise national policy, be derived from domestic sources. The above figures tend to verify what the theoretical discussion has brought out: that protection in the case of the sugar industry is not a question of deciding between two alternatives —the extinction or prosperity of the industry as a whole—but is merely a question as to the relative magnitudes of the domestic and foreign contributions to the total supply which will result from imposing different rates of duty. Before the question as to the adequacy of a given rate can be answered it must first be decided what percentage of the domestic consumption it is desired to derive from domestic sources. Some light will be thrown on this question by a study of the percentages of total consumption derived from domestic sources which have, in fact, accompanied the various rates of duty under successive tariff acts in the past. Such a study will be made later in this volume. (See pp. 162–68.)

The body framing the tariff must also decide whether the adequacy of a rate should be judged with reference

to the industry as a whole or to its least favored region. If marginal costs are used in testing the adequacy of a given rate to maintain the domestic industry in any given position of importance, it should[1] make little difference whether the several regions of domestic production are considered separately or whether the domestic industry be considered as a whole. This is because after a lapse of time the marginal costs tend to become equal in all regions. But the averages do not necessarily tend to become equal. Suppose that in two regions the marginal cost settles at 6 cents per pound, but that in one region costs descend from this point to 5 cents per pound and in the other to only 2 cents per pound. Clearly, the average in the former region will be the higher.

A great range of "equalizing rates" results from different interpretations of the law as applied to the Tariff Commission's figures. Less than two months after the passage of the Act of 1922 the United States Sugar Association, representing the interests of refiners and American investors in Cuban sugar properties, filed a petition with the Tariff Commission setting forth its belief that the duty on sugar provided in the act was "excessive, unwarranted, and too high" and requesting an investigation under the flexible provision. Such an investigation was ordered and extensive data were collected.

[1] It "should" rather than it "will." The equalization of marginal costs is a long-run tendency. In a given year the marginal costs may differ widely. Such is the case at the present time as is shown by the preliminary statement of the Tariff Commission referred to below.

December 1 the commission issued a preliminary statement showing in tabular form the result of its investigation, and on January 15, 1924, it began to hold public hearings.

The tables most important for the present inquiry are reproduced in Appendix F. They show for the years 1921 and 1922 [1] the average costs per pound of producing sugar in Cuba and in the several regions of domestic production, segregated with respect to costs of cane or beet, of manufacturing, for repairs and maintenance, for administration, and for fixed charges. They show also marketing costs and totals. Other tables show for each region the percentage of the output which can be produced at or under various progressively increasing costs.

The investigation was comprehensive and thorough; the Tariff Commission's agents visited the factories and inspected the books; returns were obtained from factories covering a high percentage of the output in all regions. It would seem that if an equalizing rate could be determined by a mathematical process the data were adequate.

Yet, by the irony of fate, the commission could hardly have chosen two successive years which would throw so wide open the doors to controversy in regard to so many questions: On which year should the comparison be based, or should it be based on an average or on a year more recent than either?

[1] Stated more accurately, the year "1921" means the crop year 1920–21 for Cuba, Hawaii, and Porto Rico and the crop year 1921–22 for Louisiana and domestic beet. The year "1922" means the crop year 1921–22 for Cuba, Hawaii, and Porto Rico, and the crop year 1922–23 for Louisiana and domestic beet.

What type of cost should be used, average or marginal? What disposition should be made of transportation charges? Should interest on capital investment be counted as a cost? Differing answers to each of these questions would result in widely differing "equalizing duties."

The year chosen for comparison affects the "equalizing rate." If, without allowing for interest or marketing costs, the average costs f.o.b. mill be taken as a basis, then for 1921 the "equalizing duty" should be −0.3793 for domestic beet, 0.4258 for the Hawaiian Islands, 0.9304 for Porto Rico, and −0.0793 for Louisiana, the simple average of which is 0.2244. That is, at costs prevailing in that year, in order to equalize costs between Cuba and domestic beet or Louisiana, a bounty should have been paid to Cuba, and the duty essential for the domestic industry as a whole should be only 0.2244 of a cent per pound against Cuba. On the other hand, if 1922 be taken as a basis, the "equalizing duty" should be 2.3934 for domestic beet, 1.9758 for the Hawaiian Islands, 1.9479 for Porto Rico, and 2.6866 for Louisiana, the simple average of which is 2.2509 cents per pound against Cuba.

The price of sugar affects the cost of producing sugar. The reason why so great a disparity hinges on the choice of year calls for explanation. It is due chiefly to the custom of paying for raw material, cane or beets, a price dependent on the price of sugar. In Cuba the centrals pay the colonos for cane in terms of so many pounds of sugar (at the f.o.b. Cuban port price) per ton of cane, the price

being the average of the prices within two weeks of the delivery of the cane. A similar method prevails in Louisiana and Porto Rico. Beet farmers are paid a basic price plus a sliding scale increment based on the price received by the factory for refined sugar. In the Hawaiian Islands also laborers receive a basic wage plus a bonus graduated according to the price of sugar.

The application of these methods of payment to the present case becomes apparent when taken in connection with the prices of sugar prevailing during the periods covered by the commission's statement when the several crops were being harvested and paid for. These prices may be briefly summarized as follows:

AVERAGE NEW YORK PRICE IN CENTS PER POUND

	1920–21	1921–22	1922–23
96° centrifugals, c. and f.: December 1 to June 1—Cuban crop	4 38	2.24	5.00
	1921	1922	1923
September 1 to December 31—Louisiana crop	2.52	3.65	5.51
Refined granulated: September 1 to December 31—domestic beet crop	5.38	6.86	8.97

It will be seen that the price of raw sugar in 1921–22 during the period in which the Cuban cane crop was being harvested and paid for was much

lower than for the corresponding period of 1920–21 (2.24 against 4.38), while the price both of raw and refined sugar in 1922 during the period in which the Louisiana cane and domestic beet crops were being harvested and paid for was much higher than for the corresponding period of 1921 (raw, 3.65 against 2.52; refined, 6.86 against 5.38). Hence, since the price of sugar is reflected in the price of cane or beets, and since the cost to the factory of cane or beets constitutes some 60 per cent of the total cost of producing sugar, it follows that the Cuban cost was high relatively to domestic costs in 1921 and low in 1922. This is the chief cause of the great disparity shown between the "equalizing rate" computed for 1922 and that computed for 1921.

The method pursued by the commission in obtaining the cost of producing sugar is open to the objection that except in cases where the factory produces its own cane or beets no account is taken of the actual costs in the agricultural stage of the industry. In place of these agricultural costs it substitutes as the cost of cane or beets the amount paid by the factory to the independent grower. As this payment depends on the selling price of sugar when the cane or beets are delivered, it may be much above or below the actual cost of production.

In the discussion of the sugar duty in Congress so much emphasis was placed upon the protection of the agricultural stage of the industry that it is evident that members held the view that it was the duty on sugar rather than the duty on cane or beets which was to afford efficient protection to the farmer.

It would therefore seem a logical conclusion that in comparing costs under the flexible provision of the tariff the commission should have treated the industry as a unit and ascertained the actual costs in its agricultural as well as in its manufacturing stage.

In explanation of the commission's method it may be said that the task of ascertaining agricultural costs is one of vast magnitude and attended with much uncertainty, and that possibly in the long run the average price paid for beets or cane will not be very far from the cost of producing them, including the current rate of agricultural profits. Nevertheless, when this method is followed it represents the cost of producing sugar as being in part determined by the price paid for sugar in the market. From this it follows that if the price of sugar is increased by the tariff the "cost of producing sugar" will also be apparently increased and the increased duty justified.

The type of cost used, the treatment of transportation costs, and the interest on investment also affect the "equalizing rate." Even if marginal costs had become normal an equalizing rate based on marginal costs would probably be greater than one obtained by comparing the Cuban average with the average cost of producing the entire domestic output considered as a unit. At present, marginal costs in the several regions of domestic production are far from equal, and hence a rate obtained by comparing the Cuban marginal cost with the highest domestic marginal cost will show an even greater disparity. If domestic regions show a greater investment per pound of sugar produced than Cuba then a greater

"equalizing rate" would result from the inclusion of interest on investment as an item of cost of production than would result from its exclusion. If transportation charges to competing points are greater for the domestic industry than for Cuba then the equalizing duty will be increased by including such charges among costs of production.

How the Cuban and domestic interests interpreted the act at the hearings. At the public hearings (January 15–24 inclusive) there was some difference of opinion among the representatives of the domestic interests with respect to transportation charges and interest on investment. The Hawaiian interests, having high transportation costs and heavy investment, thought these items should be included. Others thought such inclusion impracticable. But the representatives of the domestic interests were unanimously of the opinion that the only rational interpretation of the intent of Congress called for a comparison based on "bulk-line" [1] costs for the year 1922. They held that the duty should be sufficient to protect the industry in its highest-cost region and that this end could only be attained by using the "bulk-line" cost. They further held that the year 1922 should be used as being the most recent year for which the Tariff Commission had obtained data. The representatives of the Cuban and refining interests, on the other hand, asked that the "equalizing duty" be based on a weighted average of all Cuban costs as compared with a

[1] The term "bulk-line" as used at the hearings is synonymous with the term "marginal" as used in this study.

weighted average of all domestic costs considered as a unit (irrespective of regions) and that the crop year 1922–23 for both domestic and Cuban sugars should be used. They further asked that the Philippine Islands, from which the commission had as yet secured no data, be included as a region of domestic production. They urged that the act called for a rate sufficient to equalize costs of domestic sugars—not Michigan or Louisiana sugars, for instance—with foreign sugars, and that the most recent data be used. They had themselves already submitted a large amount of data for 1922–23, and they asserted that the remainder could be quickly procured.

An equalizing rate based on bulk-line costs for the year 1922 is shown by the commission's preliminary statement (assuming a cost which covers 90 per cent of the output to be the bulk-line cost) to be, in cents per pound, 2.29 for the Hawaiian Islands, 2.63 for Porto Rico, 2.86 for Louisiana, and 2.92 for domestic beet. If the highest-cost region (domestic beet) be made the basis for fixing the rate, the "equalizing duty" would therefore be 2.92 cents per pound. As, however, the President is not permitted by the act to raise or lower the rate by more than 50 per cent, he would (if on the advice of the commission he accepted the interpretation of the act made by the domestic producers) fix the rate at 50 per cent above the present rate; that is, at 2.6472 cents per pound.

What rate would result from adopting the interpretation made by the Cuban representatives can only be estimated. No figures have been collected

from the Philippine Islands, and the commission has as yet published no figures for the crop year 1922–23 from Cuba, Porto Rico, or Hawaii. Figures for Louisiana and domestic beet for that year are shown in the commission's statement.[1]

Referring to the table of prices on p. 140 it will be seen that the price of raw sugar from December 1, 1922, to June 1, 1923, was slightly higher than for the same period in 1920–21; and it may be conjectured that the cost of producing sugar in 1922–23 was not greatly different in Cuba, Porto Rico, and the Hawaiian Islands from the cost in 1920–21. Using, therefore, the average costs of 1920–21 for Cuba, Porto Rico, and the Hawaiian Islands and the 1922–23 costs for domestic beet and Louisiana cane, the equalizing rate would be, in cents per pound, 0.43 for the Hawaiian Islands, 0.93 for Porto Rico, 0.80 for Louisiana, and 0.51 for domestic beet. Applying to these figures an average weighted in accordance with output, the resulting "equalizing rate" would be 0.61. As a reduction from the present rate to 0.61 of a cent per pound would be a reduction of more than 50 per cent, the President, if on the advice of the Tariff Commission he accepted the Cuban representative's interpretation of the act, would presumably reduce the rate 50 per cent, that is to 0.8824 of a cent per pound.

It is evident that interpretation of the act leaves considerable latitude to the commission.

[1] It will be noted that the Cuban request was to use in connection with the 1922–23 beet and Louisiana crop the Cuban, Porto Rican, and Hawaiian costs for the crop *following* instead of *preceding* that crop—as was asked by the domestic interests.

The adoption of either the domestic or Cuban plan would call for a speedy reopening of the case. The act requires the President, on receiving the findings of the Tariff Commission that the duty does not equalize costs of production, to change it (within the specified limits) so that it shall equalize such costs. The most recent costs for which full data have been obtained are those of the year 1922, but, as shown above, an equalizing rate based on that year would be far above the difference between costs of production for the crop year 1922–23; and there is reason for believing, since the price of sugar in the fall and winter of 1923 was much higher than in the same period of 1922 (see p. 140), that the latter difference would be much less than the difference for the year 1923. Therefore, were the President to raise the rate in accordance with the plan proposed by the domestic interests, it would be necessary to lower it as soon as full returns were in for the crop year 1922–23, and then probably raise it again as soon as Louisiana and domestic-beet returns were in for the 1923–24 crop. This would undoubtedly satisfy the conditions of a "flexible tariff" but it would be a result to be deplored by both domestic and Cuban interests, especially as (owing to the long time required for collecting and tabulating data) the rate would be fixed upon conditions of past history which were no longer applicable to existing conditions.

The rate should be adjusted with a forward look to stabilizing the industry. The difficulty referred to at the close of the last paragraph can not be wholly avoided. A rate determined in accordance with the

provisions of the act must be based upon past conditions—and conditions are constantly changing. It is believed, however, that price conditions in both of the years shown in the commission's preliminary statement were highly exceptional. An "equalizing rate" based on the year 1921 would be entirely inadequate for the domestic industry, while a rate based on the year 1922 would err as much in the opposite direction in being unnecessarily high. From such evidence as is afforded by sugar prices (see p. 140) the crop year 1922–23 (asked for by the Cuban interests) would approximately duplicate conditions of 1921. In the interest of stabilizing the industry the President and the Tariff Commission might overlook slight departures of the established rate from an "equalizing rate" determined from year to year, in the expectation that disparities would tend to neutralize each other. They could, however, hardly overlook such disparities as would result from fixing a rate based on any of the single years for which data have been secured or are shortly to be secured—that is, 1921, 1922, or the crop year 1922–23.

There is considerable evidence that a rate based on an average of the costs for 1921 and 1922 would be such a stabilizing rate.

If the commission should decide to use an average of the costs for 1921 and 1922, the question will still remain whether the rate should be based on a weighted average for all regions as proposed by the Cuban interests or on marginal costs as proposed by the domestic interests.

On the first hypothesis, averaging the commission's figures for 1921 and 1922, taking f.o.b. mill costs, excluding interest on investment, but including marketing expenses, with allowance (in the case of domestic beet only) for transportation of Cuban sugars to Chicago after being refined, the equalizing rate in cents per pound would be: domestic beet, 0.96; Hawaiian Islands, 1.44; Porto Rico, 1.44; Louisiana, 1.12; weighted average, 1.22.

On the second hypothesis, using marginal (bulk-line) costs (on the assumption that the marginal cost is the cost at or under which 90 per cent of the output in each region can be produced), allowing for marketing expenses and (in the case of domestic beet only) for transportation of Cuban sugars to Chicago after being refined, the equalizing rate would be in cents per pound: domestic beet, 1.15; Hawaiian Islands, 1.66; Porto Rico, 1.63; Louisiana, 0.96.[1]

If, following the suggestion of the domestic interests, the highest rate be taken the equalizing duty would become 1.66 cents per pound. It must be remembered, however, that under the operation of

[1] In the estimates just made the beet-sugar industry was taken as a whole. For some years the Tariff Commission has printed tables segregating the costs of producing beet sugar by regions—Pacific, Mountain, and Eastern. In these tables the Eastern region is shown to be at a considerable disadvantage as compared with the other two. The cost of producing beet sugar in Michigan and the surrounding States is shown to be some 0.7 of a cent per pound greater than elsewhere. In previous reports Louisiana also is shown to be at a disadvantage compared with other regions of domestic production. In the most recent and comprehensive data collected, however, Louisiana shows to good advantage.

economic law the marginal costs in all regions tend to become equal. It is probable that the present disparity indicates that in some regions the marginal cost is above and in other regions below normal. An average of rates based on marginal cost would be: simple average, 1.35; weighted average, 1.37.

Another method would be to array the costs factory by factory for the entire domestic production without reference to regions, and use as the marginal cost the cost at or under which 90 per cent of the entire output could be produced. It is probable that this method would yield a result about the same as that given in the text as having been obtained by averaging the marginal costs.

An average of the average costs for previous years for which the commission has collected data (pre-war, 1916–17, 1917–18, 1918–19, see p. 286) indicates a rate of about 1.25 cents per pound as the "equalizing rate." It will be recalled that at the time the Act of 1913 was enacted the rate of 1.0048 cents per pound appeared to be sufficient to stimulate the domestic industry to increased output and that, on the theory that costs had increased in all regions in the same ratio as index numbers, a rate of 1.5 cents per pound now would be equivalent to a rate of 1 cent per pound then. A study of the commission's most recent figures leads to results not greatly dissimilar.

It is believed that a rate of from 1.25 to 1.50 cents per pound would stabilize the industry and would afford adequate protection to all efficient domestic producers.

CHAPTER VI

EFFECTS OF TARIFF CHANGES ON PRICES AND THE GROWTH OF THE DOMESTIC INDUSTRY

It is comparatively easy to trace by economic reasoning the logical effects of a change in the duty. It is extremely difficult to verify this reasoning by an appeal to experience in any specific case. So many other factors are involved that the effect of the change in the tariff can not be isolated. To mention only a few of the disturbing factors: there may be a strong and steady increase in demand, new and highly productive regions may be opened to cultivation, changes may occur in the purchasing power of money, or a large surplus stock may be accumulated. Any one or all of these factors may contribute to the result (as shown by a simple comparison of changes in duties with changes in prices) to such an extent that the effect logically due to the change in the duty is altogether obscured.

In spite of the difficulties mentioned above a statistical study will be attempted of the tariff acts from 1890 to 1922 inclusive, in their bearing upon prices, imports, and the growth of the domestic industry. The study should prove instructive in many ways—in none more so than in showing the futility of the direct comparison of tariff changes and prices mentioned above. Such comparisons,

unfortunately, are extremely popular in political discussions. Advocates of protection are wont to point to instances where an increase in duty has been followed by stationary or even declining prices and to argue that such figures prove that protection is no injury or is even a benefit to consumers. Opponents of protection have had no difficulty in finding figures which to themselves are equally convincing.

The subject will be treated under the following four heads: I. Tariff changes and prices, 1890–1919. II. Tariff changes and domestic production, 1890–1919. III. Special study of the acts of 1921 and 1922 with reference to prices, imports, revenue, and domestic production. IV. Effect of changes in the duty on raw sugar upon the price of refined sugar.

I. TARIFF CHANGES AND PRICES, 1890–1923

The discussion may be begun by calling attention to Table XI, which shows the rates of duty under successive acts and the average real (see p. 153) and money prices of sugar during their continuance.

Direct comparison of price changes and tariff changes is futile. It will be recalled that an increase in duty should normally be followed by an increase in price by an amount somewhat less than the increase in duty, and that a decrease in duty should normally be followed by a decrease in price by an amount somewhat less [1] than the decrease in duty

[1] The qualification "somewhat less" applies more particularly to changes after the Cuban preference was granted in 1903. Before that date the increase or decrease in price should normally be very nearly equal to the full increase or decrease in the duty.

(see pp. 119–22). The following paragraphs will show to what extent such expectations have, in fact, been realized and when not realized how the departure is to be explained.

TABLE XI.—Tariff Changes under Successive Acts and Sugar Prices during their Maintenance

1	2	3	4	5	6	7	8
Period	Rate of duty, cents per pound	Increase (+), decrease (−)	Money price	Increase (+), decrease (−)	Per cent increase (+), decrease (−)	Real price relative to 100 per cent, 1890–1894[c]	Per cent increase (+), decrease (−)
1890–1894	Free; bounty 2¢ per lb.	.....	3.66	....	....	100.0	
1894–1897	40 p. c. = ±0.8 ¢	+0.8000	3.42	−0.24	− 6.5	104.5	+ 4.5
1897–1903	1.6850	+0.8850	4.08	+0.66	+19.3	108.3	+ 3.8
1903–1913[a]	1.3480[b]	−0.3370	3.99	−0.09	− 2.2	88.6	−19.7
1913–1919	1.0048[b]	−0.3432	5.22	+1.23	+30.8	86.9	− 1.7
1921–1922	1.6000[b]	+0.5952	4.34	−0.88	−16.9	62.0	−24.9
1922–1923	1.7648[b]	+0.1648	6.37	+2.03	+46.8	84.9	+22.9

[a] In 1903 the reciprocity treaty with Cuba went into effect, giving Cuban sugar a 20 per cent reduction from the full-duty rate established by the Act of 1897. No change was made in the Act of 1909; hence, this act does not appear in the table.

[b] Cuban rate, 20 per cent less than full-duty rate.

[c] Money price, divided by Bureau of Labor index numbers of wholesale prices and reduced to percentages of an assumed 100 per cent for the price under the Act of 1890.

Even a superficial glance at the table shows the utter futility of any attempt to determine the effect

of changes in the tariff on the price of sugar by a simple comparison of the change in the tariff with the change in the money price. Not only does the change in price bear no quantitative relation to the change in duty, but in three of the six periods given the change in price is not even in the same direction as the change in duty. Under the Act of 1894 the duty is 0.8 of a cent higher than under the Act of 1890, but the price averages 0.24 of a cent lower. Under the Act of 1913 the duty is 0.3432 of a cent lower than under the preceding act, but the price is 1.23 cents higher. Under the Act of 1921 the duty is 0.5952 of a cent higher than under the preceding act, but the price is 0.88 of a cent lower.

One factor tending to obscure the effect upon prices of changes in the tariff, namely, changes in the purchasing power of money, can be partly eliminated by the use of index numbers. The "money prices" in column 4 of the table were first divided by the Bureau of Labor index numbers of wholesale prices for the corresponding periods, and the results were then reduced to percentages of an assumed 100 per cent for the period 1890–94. The percentages so obtained are found in column 7 under the head of "real prices." To illustrate the significance of column 7, we may compare prices for the period 1903–13 with prices for the period 1890–94. The "money price" has risen from 3.66 to 3.99, an increase of 9 per cent, but the "real price," that is, the price of sugar in terms of the general run of commodities, has fallen from 100 to 88.6, a decline of 11.4 per cent. In the latter period it

takes more money to buy a pound of sugar but less of other things. Since money is merely the medium with which things having a real value-in-use are exchanged for one another, sugar, though apparently dearer, is "really" cheaper in the latter period than in the former.

Referring to the table, it will be seen that when the effects of changes in the purchasing power of money are eliminated the changes in price (columns 7 and 8) are in the same direction as changes in the duty (columns 2 and 3) under every act except the Act of 1921. Abnormal conditions in the years 1920 and 1921 (see p. 169), are sufficient to account for this exception.

Prices Compared by Acts.—In the following paragraphs an attempt will be made, in comparing price changes with tariff changes, act by act, to eliminate the effects upon prices due to other factors and show the effect due to the change in the tariff alone.

1894–97.—Referring to the table, it will be seen that the Act of 1894 raised the rate of duty about 0.8 of a cent per pound above the rate of the Act of 1890. The average money price during the period of the Act of 1894 was actually 0.24 of a cent per pound less than under the Act of 1890. If, however, real prices are studied, it is seen that there was a rise in the price of sugar as compared with other commodities from the figure 100 to the figure 104.5, or 4.5 per cent. The period under consideration was marked by a business depression which was world-wide, but which was more severe in the

United States than elsewhere. General prices in the United States were about 14 per cent lower during the period of the Act of 1894 than during the period of the Act of 1890, while in England the difference was only about 10 per cent. But during both periods the world price in sugar was fixed in the Hamburg market, which was virtually the London market. It would appear that the decline in the world price of sugar was a little more than sufficient to neutralize the increase in duty and hence that in spite of the increase in duty the money price under the Act of 1894 was actually slightly lower than under the Act of 1890. But since the general price level in the United States fell more than the world price of sugar, the "real price" of sugar appeared to rise. Moreover, the Act of 1894 was of short duration. It takes some time for marginal costs to adapt themselves to changes in the tariff (p. 124). It is not unlikely that for a year or more foreign producers, in order to dispose of their stock, sold sugar in the United States at a price somewhat lower than they would have obtained had the duty not been raised; that is, that in part the duty was paid by the foreign producers.

1897–1903.—In 1897 the duty was raised 0.885 of a cent above the rate of the Act of 1894. During the period from 1897 to 1903, when the Cuban reciprocity treaty went into effect, the average money price of sugar was 0.66 of a cent higher than it had been under the Act of 1894—an amount approximating the change in duty and apparently corroborating the theory. It will be noted, however, that

this increase of 0.66 of a cent in money price is an increase of 19.3 per cent, while the corresponding increase in real price is only 3.8 per cent, and it is the change in real price which should be the more significant. Again, the disparity may, in part, at least, be accounted for by the difference between the changes in foreign and domestic price levels. The period was one of business recovery both in the United States and England, but just as the depression had been greater and deeper in the United States so was the recovery more rapid and more complete; English price levels advanced about 5 per cent while American price levels advanced about 15 per cent. Hence, as sugar prices tended to conform more nearly to English price levels, the sharp advance in American price levels made the advance in the price of sugar in terms of other commodities less apparent. Again, during this period the trend in "real" prices was decidedly downward, due presumably to improved methods and processes. This downward trend would, of course, tend to neutralize the increase in price normally to be expected from the increased duty.

1903–13.—In 1903 the duty on Cuban sugar was reduced 0.337 of a cent per pound and no further change in rate was made until 1913. During this period the average money price was 0.09 of a cent per pound lower than during the period 1897–1903, a reduction of only 2.2 per cent—much less than the reduction in duty. The reduction in real price, however, was 19.7 per cent (about 0.8 of a cent), a reduction much greater than the reduction in duty.

The fact that the money price remained practically stationary may be accounted for by the general upward trend in price levels during the entire period. English price levels rose about 10 per cent, an amount just about sufficient to neutralize the slight reduction in the duty on Cuban sugar. Moreover, for several years full-duty sugar continued to be imported in large quantities, tending to establish the New York price. So long as this situation continued the Cuban producer accepted the going price and added the reduction in duty to his own profits. Eventually this bonus to Cuban producers so stimulated the Cuban industry that competition reduced the price below that at which other foreign producers could afford to sell in the American market. Not until this period arrived did the reduction in duty have any tendency to reduce the duty-paid price. While the English general price level was advancing 10 per cent, as above stated, the American general price level was advancing about 20 per cent. Hence, while the money price of sugar remained nearly stationary, the value in terms of other commodities fell, thus partly accounting for a drop in "real price" by an amount more than double the slight decrease in Cuban duty. The general downward trend of real prices, due presumably to improved methods and processes, is probably also responsible in part for the fact that real prices declined so much more than is to be accounted for by the change in duty.

1913–19.—The Act of 1913 reduced the rate of duty on Cuban sugar 0.3432 of a cent per pound.

From January, 1914, to December, 1919, the average money price was 1.23 cents per pound higher than during the preceding period, while the average real price was 1.7 per cent (about 0.07 of a cent lower). The act continued in effect until May 27, 1921, but during the years following 1919 the conditions in the sugar industry have been so abnormal that this period will receive special treatment in another place. (See p. 169.) The increase in money price of 1.23 cents per pound, above mentioned, is obviously due to war conditions. A rapid advance was taking place in the price level of commodities in general, an advance in which sugar shared. In comparison with the forces tending to influence prices set loose by the war, the change in the rate of duty was unimportant. It is nevertheless significant that, when "real prices" are considered, the fall in the price of sugar was in the same direction as the change in the rate of duty.

A general downward trend of prices, due chiefly to improved methods of production, may be observed during the whole period 1890–1917. Both real and money prices fluctuated considerably from month to month and from year to year during the several periods just considered; but it is significant that during each of these periods (except the brief three-year period covered by the Act of 1894) and during the entire period from 1890 to 1917 inclusive, considered as a unit, the *trend* of real prices was downward. During this period rates of duty varied from zero (with a bounty of 2 cents per pound) under the Act of 1890 to 1.685 under the Act of 1897, yet the

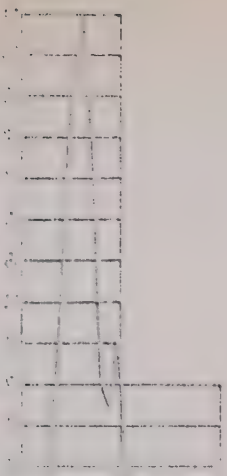
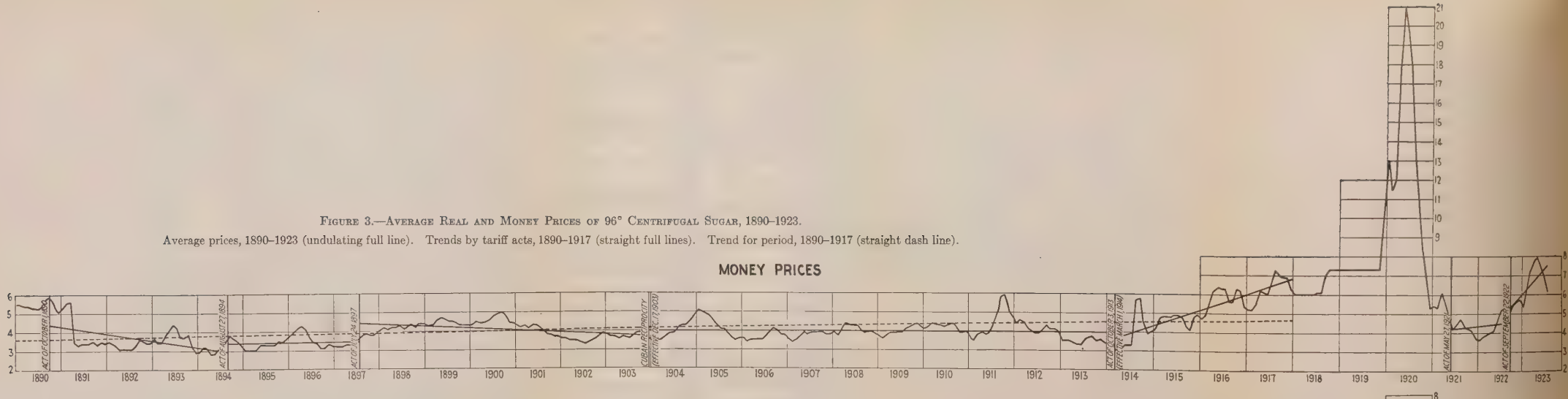


FIGURE 3.—AVERAGE REAL AND MONEY PRICES OF 96° CENTRIFUGAL SUGAR, 1890–1923.

Average prices, 1890–1923 (undulating full line). Trends by tariff acts, 1890–1917 (straight full lines). Trend for period, 1890–1917 (straight dash line).



To face page 159.

only change in duty that was sufficient to arrest this general tendency of real prices downward was the increase in duty from zero to 40 per cent (0.8 of a cent per pound) imposed in 1894; and even during the three-year duration of this act the trend was only slightly upward. (See fig. 3.) The natural interpretation is that during the twenty-seven years improvements in methods and processes of sugar production were steadily progressing, and progressing more rapidly than was the case with commodities in general.

The causes resulting in this downward trend were more than sufficient to counteract the normal tendency of increasing demand to raise the marginal cost. The evidence afforded by the downward trend of "real" sugar prices from 1890 to 1917 makes it necessary to modify to some extent the statements made in regard to marginal cost on pages 110–114. Following the usually accepted line of economic reasoning, it was there assumed that when a commodity was produced by competing establishments at varying costs, as was shown to be the case with sugar, an increased output could be produced only at an increased marginal cost. It was assumed that competition would impel producers to appropriate lands in their order of productiveness, and hence that at any given time all the sites most available for the purpose in hand would have been already appropriated, and hence that in order to increase the output it would be necessary to resort to less available sites on which the cost of production would be greater. Those inferior sites would not be used until the increased

demand had raised the price sufficiently to justify producing at the increased cost. This increased cost would now become the new marginal cost; that is, the marginal cost would be raised.

It is doubtful, however, if lands are appropriated in their order of productiveness with any such mathematical precision as the above reasoning would lead one to suppose; moreover, the theory overlooks the counteracting tendency to lower marginal costs arising from discovery and invention. Competition stimulates all producers to lower their costs and results in improved methods, improved machinery, and the opening of new regions. It is clear that in the sugar industry during the twenty-seven years under discussion this latter set of forces has on the whole prevailed over those tending to raise the marginal cost; and hence that the vastly increased output of sugar has been attained not only without raising the marginal cost but actually with its lowering.

The same causes also obscured the effect of tariff changes. It was stated (p. 120) that an increase in the duty on sugar tended to raise the marginal cost and hence the price. The last paragraph makes it clear that the forces tending to lower marginal cost may be sufficient to prevail over the tendency to raise marginal cost brought about by the increase in duty and that hence the price of sugar after the increase in duty may actually be lower than it was before. Unless, however, it can be shown that the tariff caused the existence of the forces tending to reduce marginal cost, it may still be confidently

stated that the price was higher than it would have been had the duty not been raised.

An interesting example occurred in connection with the Act of 1897. This act raised the rate of duty about 0.885 of a cent per pound. In the year following (see fig. 3) the "real" price rapidly rose until it was higher by just about the figure 0.8 than it had been during the last year of the preceding act. From this time on, however, there was a decided downward trend so long as that rate remained in force. In 1902, just before the Cuban preference went into effect, the "real" price was lower than it had been any year under the preceding act. This, however, by no means proves that it would not have been still lower had the duty not been raised.

Allowing for disturbing factors, prices tend to follow tariff changes as expected. The conclusion derived from the above comparison of prices with rates of duty under successive acts is necessarily somewhat negative. It has been impossible to isolate the changes in price due to tariff changes entirely from changes due to other causes. By the use of index numbers and the reduction of "money" prices to "real" prices, the effect of changes in the purchasing power of money has been partly eliminated; but the fact that foreign index numbers followed a somewhat different course from domestic index numbers has introduced a disturbing element. And, again, the general but not uniform tendency to lower prices resulting from improved methods, invention, and the opening of new fields obscured the logical effects of the tariff. It is highly probable that at

times prices were influenced by speculation and perhaps by combination, and they were certainly affected by the war. In spite of these uncertainties it is to be noted that "real" prices did in the main move *in the direction* logically to be expected from the preceding change in the tariff, though the magnitude of the price change bore little relation to the magnitude of the tariff change. Of course, during the whole period the duty-paid price in New York differed from the c. and f. price by virtually the amount of the duty. This, however, is inconclusive, as the vital question is whether the change in duty affected the duty-paid price or the c. and f. price; that is, whether it affected the domestic consumer or the foreign producer. This, at least, may be said positively: nothing has been brought out from the statistical study of prices inconsistent with the statement that an increase in duty tends to increase the price to the consumer and a decrease in duty tends to lower the price to the consumer.

II. TARIFF CHANGES AND DOMESTIC PRODUCTION, 1890–1919

It was shown in Chapter V (p. 121) that an increase in the duty tended to increase the proportion of the total domestic consumption derived from domestic sources and to diminish the proportion derived from foreign sources. Table XII and figures 4 and 5, which are diagrams plotted from Table XII, may be studied in this connection; the yearly data are fitted, by tariff acts, with straight-line trends. (See pp. 163–165.)

TABLE XII.—Total Yearly Domestic Production, and the Percentage of Total Domestic Consumption Derived Respectively from Foreign and Domestic Sources, 1890 to 1922

Year	Total domestic production (in 1,000 tons)	Per cent domestic consumption from	
		Domestic sources	Foreign sources
1890	480	31.4	68.6
1891	591	26.8	73.2
1892	627	24.5	75.5
1893	698	26.5	73.5
1894	714	25.9	74.1
1895	794	28.4	71.6
1896	787	27.4	72.6
1897	847	27.2	72.8
1898	833	34.7	65.3
1899	706	25.1	74.9
1900	612	25.9	74.1
1901	850	34.6	65.4
1902	1,056	34.0	66.0
1903	1,158	40.8	59.2
1904	1,062	35.8	64.2
1905	1,281	41.5	58.5
1906	1,413	40.6	59.4
1907	1,431	43.4	56.6
1908	1,649	49.7	50.3
1909	1,650	50.0	50.0
1910	1,799	48.9	51.1
1911	1,930	52.0	48.0
1912	2,098	49.4	50.6
1913	2,028	46.3	53.7
1914	2,276	45.0	55.0
1915	2,252	51.0	49.0
1916	2,371	54.0	46.0
1917	2,557	58.9	41.1
1918	2,401	45.6	54.4
1919	2,378	47.8	52.2
1920	2,029	34.2	65.8
1921	2,518	53.9	46.1
1922	2,579	42.5	57.5

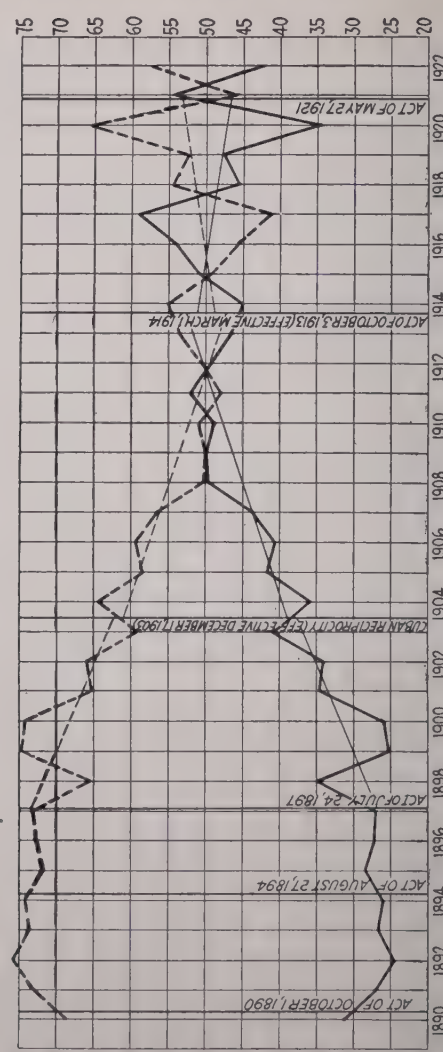


FIGURE 4.—PERCENTAGES OF TOTAL CONSUMPTION OF REFINED SUGAR IN THE UNITED STATES DERIVED FROM DOMESTIC SOURCES (undulating full line) AND FROM FOREIGN SOURCES (undulating dash line) BY CALENDAR YEARS, 1890–1922. TRENDS, BY TARIFF ACTS, ALSO SHOWN.

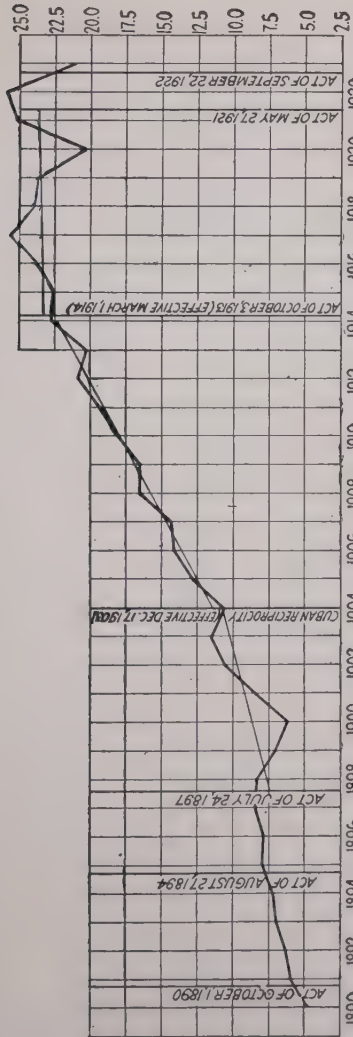


FIGURE 5.—TOTAL DOMESTIC SUGAR PRODUCTION IN HUNDREDS OF THOUSANDS OF TONS, REFINED SUGAR BASIS, BY CROP YEARS, 1890–1923 (undulating full line), AND TRENDS BY TARIFF ACTS (straight full lines).

No rate of duty from 1890 to 1917 was so low as to prevent the steady growth of the domestic industry. A study of the table and a glance at the diagrams make it apparent that under every act from 1890 to 1917 the domestic industry has increased in absolute tonnage. Moreover, under every act except the Act of 1890 the domestic industry has also increased in relative importance. The rapidity of increase, however, has differed under different acts. Under the Act of 1890 there was a moderate increase in absolute tonnage but a decrease in relative tonnage. The increase in absolute tonnage continued under the acts of 1894 and 1897 and became very rapid during the period 1904–13. The increase continued under the Act of 1913 and nearly as rapidly until 1917, but showed a marked falling off from 1917 to 1920. In relative tonnage also an increase, beginning in 1894, continued more rapidly under the Act of 1897, the Cuban preference under the acts of 1897 and 1909, and under the Act of 1913 until 1917. From 1917 to 1920, however, there was a sharp decline.

Was the rate under the Act of 1913 sufficient after 1917? The inference to be drawn is that under all of the acts shown until the Act of 1913 the rates of duty (or, under the Act of 1890, the bounty) were amply sufficient not only to enable the domestic industry to grow but to grow in relative importance as compared with the Cuban industry. It is doubtful, however, whether the rate under the Act of 1913 would in the long run have proved sufficient. It is true that during the first four years the increase

both in absolute and relative tonnage was about as rapid as it had been under the preceding act; and it is to be remembered that the reduction in rate was not very great—about one-third of a cent per pound. But after 1917 there was a decided slump both in absolute and relative output until 1920.

The increase up to 1917 would probably have taken place even if the reduction in duty had been much greater. The war situation, involving the partial destruction of the European beet-sugar industry and the increased European demand for Cuban sugar, would have been sufficient to stimulate the domestic industry. Add to this the fact that during a part of this period the domestic industry was subject to governmental price fixing and that it was the avowed purpose of the Food Administration to fix the price at a figure that would stimulate domestic production, and there was sufficient reason for the advance up to 1917.

Several factors contributed to the subsequent slump. The war closed in 1918 and the European beet-sugar industry began slowly to recover. East Indian sugar became more accessible. A vast influx of American capital into Cuba was followed by the opening up of extremely productive regions in the eastern part of the island and the reorganization of the Cuban industry along lines of American efficiency. Finally, the rate of 1 cent per pound imposed in the Act of 1913 did not represent by any means the same measure of protection in the later years of the act that it did in 1913. Prices and costs had so increased that it would have required

approximately 1.5 cents to represent the same purchasing power as 1 cent in 1913. (See pp. 127–129.)

In spite of this, the evidence that the rate of 1 cent per pound was insufficient to maintain the domestic industry from year to year in about the same relative position with regard to Cuban importations can not be regarded as conclusive. Under preceding acts the rates had been sufficient to bring about a rapid gain. A less rate would be sufficient if the mere maintenance of the ratio were all that was desired. Moreover, it will be noted that in 1921 there was a marked rally both in absolute and relative tonnage. This can hardly be attributed to the increase in duty of that year. The Emergency Act did not go into effect until May 27, and by that time the crops were committed to a definite output.

III. SPECIAL STUDY OF THE ACTS OF 1921 AND 1922 WITH REFERENCE TO PRICES, IMPORTS, REVENUE, AND DOMESTIC PRODUCTION

The period from 1920 to the present time (1923) calls for special study. During this period there have been unprecedented fluctuations in prices, abnormal imports, months of unparalleled prosperity to the industry and of equally unparalleled disaster. The period has also been characterized by the passage of two tariff acts, the first, May 27, 1921, raising the rate of duty on Cuban sugar from 1.0048 to 1.6 cents per pound, and the second, September 22, 1922, still further raising the rate from 1.6 to 1.7648 cents per pound. The bearing of the abnormal conditions in the industry upon the

passage of these acts and the reciprocal effects of these acts upon (1) prices, (2) imports, (3) revenue, and (4) domestic production will be the subject of the following paragraphs:

1. Effects of the Acts of 1921 and 1922 upon Prices

The sugar situation in 1920 was abnormal. During the war the sugar industry was under government regulation with respect to prices and distribution. During this period there was an acute "sugar famine." Rationing was extended to all consumers, and at times and in some sections of the country it was impossible for households to obtain any sugar whatever. Government regulation was withdrawn at the end of the year 1919. The war had curtailed the world output of sugar. It is true that in some regions, especially Cuba, production had been greatly stimulated, but not sufficiently to offset the greatly decreased beet-sugar production of Europe. The net loss in the world output was some 3,500,000 tons. In view of this shortage, when government regulation was withdrawn the experience of the war period aroused apprehension of another famine. This apprehension, as events proved, was unwarranted. The war, it is true, had decreased the supply, but the disordered condition of the world had decreased the effective demand in about the same proportion. Nevertheless, in fear of a shortage, consumers of sugar began early in 1920 to stock up and their competition rapidly forced up the price.

On May 19, 1920, it had reached the unprecedented figure of 23.57 cents per pound for raw sugar. At this point the market broke. The high price began to attract sugar from all quarters of the globe and the decline in price which followed was hardly less sensational than had been the preceding advance. Importations of full-duty sugar, which in normal years are almost negligible, rose in 1920 to nearly a million tons. The result was a hold-over surplus of about the amount of the full-duty importations and a demoralized condition for both the domestic and the Cuban industry.

Statistics of Prices and Imports.—The conditions outlined above and the relation borne by them and by other conditions to the tariff acts of 1821 and 1922 are set forth in Tables XIII and XIV. These tables with the accompanying diagrams (figs. 6 and 7) should prove helpful to a more perfect understanding.

Unparalleled price fluctuations were responsible, at least in part, for the increased sugar duties in the Act of 1921. The price table and the diagram (fig. 6) show the phenomenal rise in prices in 1920 to the peak on May 19, when Cuban raws touched 23.57 cents per pound. This period of high prices was a period of unparalleled prosperity for the Cuban industry and for so much of the American industry as had sugar to sell. This would apply to Porto Rico and the Hawaiian and Philippine islands, but the greater part of the 1919–20 crop in Louisiana and the beet-sugar regions had already been disposed of. From the peak in May, prices, with brief

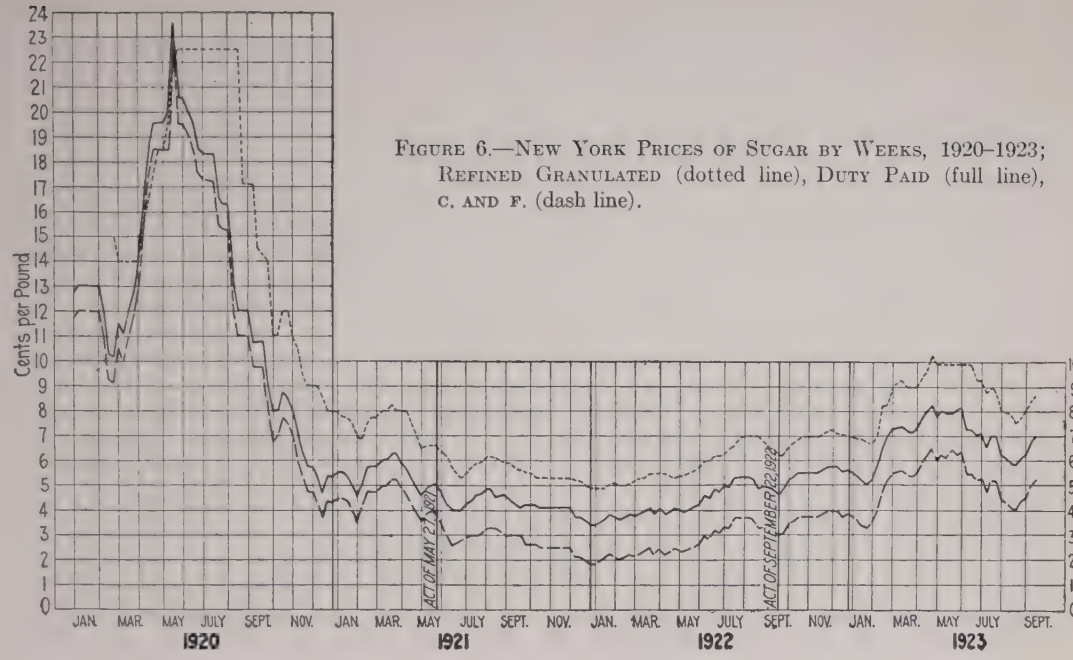

Cents per Pound
ACT OF MAY 27, 1921
ACT OF SEPTEMBER 22, 1922
JAN. MAR. MAY JULY SEPT. NOV. JAN. MAR. MAY JULY SEPT. NOV. JAN. MAR. MAY JULY SEPT. NOV. JAN. MAR. MAY JULY SEPT.
1920
1921
1922
1923

FIGURE 6.—NEW YORK PRICES OF SUGAR BY WEEKS, 1920–1923; REFINED GRANULATED (dotted line), DUTY PAID (full line), C. AND F. (dash line).

TABLE XIII.—NEW YORK PRICES, IN CENTS, C. AND F. AND DUTY PAID, OF 96° CENTRIFUGAL SUGAR AND NEW YORK PRICES OF REFINED GRANULATED, BY WEEKS FROM JANUARY, 1920, TO DECEMBER, 1923, WITH THE REFINER'S MARGIN AND THE DIFFERENCE BETWEEN THE C. AND F. * AND DUTY-PAID PRICE

Date, 1920	Price 96° centrifugals			Refined granulated	Refiner's margin	Date, 1921	Price 96° centrifugals			Refined granulated	Refiner's margin
	Duty paid	c. and f.	Difference				Duty paid	c. and f.	Difference		
Jan. 2	12.79	11.750	1.040	.....	....	Jan. 6	5.520	4.500	1 020	8.00	2.480
8	13.04	12.000	1.040	.....	....	13	5.520	4.500	1.020	7.75	2.230
15	13.04	12.000	1.040	15.00	1.96	20	5.390	4.375	1.015	7.75	2.360
22	13.04	12.000	1.040	15.00	1.96	27	5.020	4.000	1.020	7.50	2.480
29	13.04	12.000	1.040	15.00	1.96						
						Feb. 3	4.520	3.500	1.020	6.85	2.330
Feb. 5	13.04	12.000	1.040	15.00	1.96	10	5.020	4.000	1.020	6.85	1.830
12	12.04	11.000	1.040	15.00	2.96	17	5.770	4.750	1.020	7.50	1.730
19	10.28	9.250	1.030	15.00	4.72	24	5.770	4.750	1.020	7.75	1.980
26	10.16	9.125	1.035	15.00	4.84						
						Mar. 3	5.770	4.750	1.020	7.75	1.980
Mar. 4	11.54	10.500	1.040	14.00	2.46	10	6.020	5.000	1.020	8.00	1.980
11	11.03	10.000	1.030	14.00	2.97	17	6.020	5.000	1.020	8.00	1.980
18	12.04	11.000	1.040	14.00	1.96	24	6.270	5.250	1.020	8.25	1.980
25	12.79	11.750	1.040	14.00	1.21	31	6.270	5.250	1.020	8.00	1.730
April 1	14.04	13.000	1.040	14.00	....	April 7	5.890	4.870	1.020	8.00	2.110
8	16.55	15.500	1.050	[a]15.50	....	14	5.640	4.625	1.015	8.00	2.360
15	18.56	17.500	1.060	[a]16.50	....	21	5.270	4.250	1.020	7.50	2.230
22	19.56	18.500	1.060	17.50	....	28	4.890	3.875	1.015	7.00	2.110
29	19.56	18.500	1.060	18.50	....						
						May 5	4.580	3.562	1.018	6.50	1.920
May 6	19.56	18.500	1.060	18.50	....	12	4.890	3.875	1.015	6.60	1.710
13	20.01	18.500	1.510	19.50	....	19	5.020	4.000	1.020	6.60	1.580
20	23.57	22.500	1.070	21.50	....	26	5.060	3.875	1.185	6.60	1.540
27	20.56	19.500	1.060	22.50	1.94						
						June 2	4.750	[c]3.450	[c]1.300	6.35	1.600
June 3	20.56	19.500	1.060	22.50	1.94	9	4.250	[c]3.025	[c]1.225	6.25	2.000
10	20.01	19.000	1.010	22.50	2.49	16	4.000	2.600	1.400	5.75	1.750
17	19.56	18.500	1.060	22.50	2.94	23	4.000	[c]2.700	[c]1.300	5.50	1.500
24	18.51	17.500	1.010	22.50	3.99	30	4.000	[c]2.800	[c]1.200	5.30	1.300

July 1	18.31	17.250	1.060	22.50	4.19	July 7	4.250	[c]2.900	[c]1.350	5.40	1.150
8	18.31	17.250	1.060	22.50	4.19	14	4.375	3.000	1.375	5.75	1.375
15	18.31	17.250	1.060	22.50	4.19	21	4.610	3.000	1.610	5.90	1.290
22	16.55	15.500	1.050	22.50	5.95	28	4.610	3.000	1.610	5.90	1.290
29	16.30	15.250	1.050	22.50	6.20	Aug. 4	4.860	3.250	1.610	6.15	1.290
Aug. 5	16.30	15.250	1.050	22.50	6.20	11	4.860	3.250	1.610	6.15	1.290
12	13.04	12.000	1.040	22.50	9.46	18	4.500	3.250	1.250	6.15	1.650
19	12.04	11.000	1.040	22.50	10.46	25	4.555	3.125	1.430	6.00	1.445
26	12.04	11.000	1.040	[b]17.10	5.06	Sept. 1	4.610	3.000	1.610	5.90	1.290
Sept. 2	12.04	11.000	1.040	[b]17.10	5.06	8	4.375	3.000	1.375	5.90	1.525
9	10.76	9.750	1.010	[b]17.10	6.34	15	4.250	3.000	1.250	5.65	1.400
16	10.78	9.750	1.030	[b]14.50	3.72	22	4.125	3.000	1.125	5.65	1.525
23	10.78	9.750	1.030	[b]14.25	3.47	29	4.230	2.625	1.605	5.50	1.270
30	9.00	8.000	1.000	[b]14.00	5.00	Oct. 6	4.230	2.625	1.605	5.50	1.270
Oct. 7	8.00	6.750	1.250	[b]11.00	3.00	13	4.230	2.625	1.605	5.30	1.070
14	8.00	7.000	1.000	[b]11.00	3.00	20	4.110	2.500	1.610	5.30	1.190
21	8.78	7.750	1.030	12.00	3.22	27	4.110	2.500	1.610	5.30	1.190
28	8.53	7.500	1.030	12.00	3.47	Nov. 3	4.110	2.500	1.610	5.30	1.190
Nov. 4	8.03	7.000	1.030	11.00	2.97	10	4.110	2.500	1.610	5.30	1.190
11	7.02	6.000	1.020	10.50	3.48	17	4.110	2.500	1.610	5.30	1.190
18	6.26	5.250	1.010	9.50	3.24	24	4.110	2.500	1.610	5.30	1.190
25	5.77	4.750	1.020	9.00	3.23	Dec. 1	4.110	2.500	1.610	5.30	1.190
Dec. 2	5.77	4.750	1.020	9.00	3.23	8	3.730	2.125	1.605	5.20	1.470
9	5.32	4.310	1.010	9.00	3.68	15	3.730	2.125	1.605	5.20	1.470
16	4.63	3.625	0.995	8.50	3.87	22	3.610	2.000	1.610	5.00	1.390
23	5.39	4.375	1.015	8.00	2.61	29	3.420	1.810	1.610	4.90	1.480
30	5.32	4.310	1.010	8.00	2.68						
Average	13.02	11.970	1.050	16.03	3.01	Average	4.710	3.410	1.300	6.35	1.640

* Costs and freight. The price c. and f., New York, includes the price paid the foreign exporter and transportation charges to New York, but not the duty.

[a] American—nominal.

[b] American not quoted—quotation from National, Arbuckle, and Federal, New York market.

[c] Interpolated.

TABLE XIII.—NEW YORK PRICES, IN CENTS, C. AND F. AND DUTY PAID, OF 96° CENTRIFUGAL SUGAR AND NEW YORK PRICES OF REFINED GRANULATED, BY WEEKS FROM JANUARY, 1920, TO DECEMBER, 1923, WITH THE REFINER'S MARGIN AND THE DIFFERENCE BETWEEN THE C. AND F.* AND DUTY-PAID PRICE—*Cont.*

Date, 1922	Price 96° centrifugals			Refined granulated	Refiner's margin	Date, 1923	Price 96° centrifugals			Refined granulated	Refiner's margin
	Duty paid	c. and f.	Difference				Duty paid	c. and f.	Difference		
Jan. 5	3.42	1.810	1.610	4.90	1.48	Jan. 4	5.53	3.750	1.780	7.00	1.47
12	3.54	2.000	1.540	4.90	1.36	11	5.40	3.625	1.775	6.90	1.50
19	3.67	2.125	1.545	4.90	1.23	18	5.15	3.375	1.775	6.90	1.75
26	3.86	2.250	1.610	5.10	1.24	25	5.09	3.310	1.780	6.70	1.61
Feb. 2	3.73	2.125	1.605	5.10	1.37	Feb. 1	5.28	3.500	1.780	6.70	1.42
9	3.67	2.060	1.610	5.00	1.33	8	5.78	4.000	1.780	7.00	1.22
16	3.73	2.125	1.605	5.00	1.27	15	6.53	4.750	1.780	8.25	1.72
22	3.86	2.250	1.610	5.10	1.24	21	7.03	5.250	1.780	8.25	1.22
Mar. 2	3.79	2.1875	1.6025	5.20	1.41	Mar. 1	7.28	5.500	1.780	9.00	1.72
9	3.86	2.250	1.610	5.30	1.44	8	7.34	5.560	1.780	9.15	1.81
16	3.98	2.375	1.605	5.30	1.32	15	7.41	5.625	1.785	9.30	1.89
23	4.11	2.500	1.610	5.50	1.39	22	7.22	5.438	1.782	9.00	1.78
30	3.86	2.250	1.610	5.50	1.64	29	7.16	5.375	1.785	9.00	1.84
April 6	4.11	2.500	1.610	5.50	1.39	April 5	7.28	5.500	1.780	9.00	1.72
13	3.86	2.250	1.610	5.50	1.64	12	7.66	5.875	1.785	9.40	1.74
20	3.92	2.310	1.610	5.40	1.48	19	8.03	6.250	1.780	9.60	1.57
27	4.11	2.500	1.610	5.30	1.19	26	8.28	6.500	1.780	10.25	1.97
May 4	4.01	2.375	1.635	5.40	1.39	May 3	7.78	6.000	1.780	9.90	2.12
11	3.98	2.375	1.605	5.40	1.42	10	8.03	6.250	1.780	9.90	1.87
18	4.04	2.440	1.600	5.50	1.46	17	7.91	6.125	1.785	9.90	1.99
25	4.17	2.560	1.610	5.60	1.43	24	7.91	6.500	1.410	9.90	1.99
						31	8.03	6.250	1.780	9.90	1.87
June 1	4.23	2.625	1.605	5.70	1.47						
8	4.61	3.000	1.610	6.00	1.39	June 7	8.16	6.375	1.785	9.90	1.74
15	4.48	2.875	1.605	6.00	1.52	14	7.28	5.500	1.780	9.90	2.62
22	4.86	3.250	1.610	6.20	1.34	21	7.28	5.500	1.780	9.90	2.62
29	4.73	3.125	1.605	6.20	1.47	28	7.03	5.250	1.780	9.25	2.22

July	6	4.99	3.375	1.615	6.20	1.21	July 5	7.16	5.375	1.785	9.25	2.09
	13	4.93	3.310	1.620	6.50	1.57	12	6.53	4.750	1.780	8.75	2.22
	20	5.33	3.720	1.610	6.60	1.27	19	7.03	5.250	1.780	9.00	1.97
	27	5.36	3.750	1.610	6.90	1.54	26	7.03	5.250	1.780	8.75	1.72
Aug.	3	5.36	3.750	1.610	7.00	1.64	Aug. 2	6.21	4.440	1.770	8.00	1.79
	10	5.36	3.750	1.610	7.00	1.64	9	6.15	4.375	1.775	8.00	1.85
	17	5.25	3.625	1.625	7.00	1.75	16	5.90	4.125	1.775	7.90	2.00
	24	4.88	3.280	1.600	7.00	2.12	23	5.84	4.0625	1.7775	7.50	1.66
	31	4.99	3.375	1.615	6.75	1.76	30	6.15	4.375	1.775	7.75	1.60
Sept.	1	4.95	3.340	1.610	6.50	1.55	Sept. 6	6.28	4.500	1.780	8.00	1.72
	14	4.86	3.250	1.610	6.50	1.64	13	6.78	5.000	1.780	8.40	1.62
	21	4.61	3.000	1.610	6.25	1.64	20	7.03	5.250	1.780	8.65	1.62
	28	4.87	3.090	1.780	6.25	1.38	27	7.78	6.000	1.780	9.15	1.38
Oct.	5	5.28	3.500	1.780	6.60	1.32	Oct. 4	7.78	6.000	1.780	9.50	1.72
	12	5.34	3.560	1.780	6.75	1.41	11	7.66	5.875	1.785	9.50	1.84
	19	5.53	3.750	1.780	6.90	1.37	18	7.66	5.875	1.785	9.50	1.84
	26	5.53	3.750	1.780	7.00	1.47	25	7.28	5.500	1.780	9.10	1.82
Nov.	2	5.53	3.750	1.780	7.00	1.47	Nov. 1	7.08	5.313	1.777	8.70	1.61
	9	5.53	3.750	1.780	7.00	1.47	8	6.91	5.125	1.785	8.70	1.79
	16	5.53	3.750	1.780	7.00	1.47	15	7.08	5.310	1.770	8.90	1.82
	23	5.65	3.875	1.775	7.10	1.45	22	7.53	5.750	1.780	9.00	1.47
	29	5.78	4.000	1.780	7.25	1.47	28	7.78	6.000	1.780	9.25	1.47
Dec.	7	5.78	4.000	1.780	7.25	1.47	Dec. 6	7.21	5.440	1.770	9.25	2.04
	14	5.78	4.000	1.780	7.10	1.32	13	7.41	5.625	1.785	9.15	1.74
	21	5.53	3.750	1.780	7.10	1.57	20	7.41	5.625	1.785	8.90	1.49
	28	5.65	3.875	1.775	7.00	1.35	27	7.22	5.438	1.782	8.90	1.68
Average.		4.66	3.010	1.650	6.12	1.46	Average.	7.01	5.240	1.770	8.70	1.78

* Costs and freight. The price c. and f., New York, includes the price paid the foreign exporter and transportation charges to New York, but not the duty.

[a] American—nominal.

[b] American not quoted—quotation from National, Arbuckle, and Federal, New York market.

[c] Interpolated.

TABLE XIV.—Total Imports and Imports from Cuba by for the Years Specified; and Imports of

(In tons of

Month	Total dutiable sugar (cane and beet)				
	1919	1920	1921	1922	1923
January	146,611	207,214	106,277	276,123	229,306
February	293,067	339,464	282,445	363,783	228,017
March	198,193	353,019	395,346	483,198	570,760
April	315,049	290,889	348,445	332,905	354,255
May	302,081	282,546	248,483	273,157	357,203
Total 5 months	1,255,001	1,473,132	1,380,996	1,729,166	1,739,541
June	235,624	455,676	97,790	341,803	293,481
July	254,581	497,719	47,674	410,174	211,895
August	145,206	359,700	212,069	424,831	171,910
September	291,083	185,780	120,058	170,603	361,767
October	215,491	96,822	131,241	192,316	303,851
November	154,136	197,699	174,722	249,690	180,458
December	41,919	146,437	102,679	149,821	....
Total 7 months	1,338,040	1,939,833	886,233	1,939,238	....
Total	2,593,041	3,412,965	2,267,229	3,668,404	....

Month	Cane sugar admitted free of duty				
	1919	1920	1921	1922	1923
January	12,123	246	....	4,163	5,370
February	29,403	....	1,666	8,273	9,488
March	2,538	2,231	8,028	10,341	29,573
April	12,471	3,279	10,705	21,467	32,139
May	17,700	4,204	5,816	30,364	16,719
June	12,635	7,605	10,723	66,686	49,814
July	7,742	18,532	19,776	46,637	24,881
August	2,278	69,284	30,674	36,701	49,522
September	....	24,697	17,257	17,410	13,733
October	1,050	26,910	29,535	19,253	4,471
November	....	2,090	18,622	15,854	115
December	220	....	18,388	3,362	....
Total	98,160	159,078	171,190	280,511	....

* In order to study the effects of the tariff on imports, only the imports other manufacture) and reexport, from whatever source derived, are admitted exports from the published tables of imports. No sugar of domestic origin is of raw sugar it is necessary to multiply the exports by 1.07 in order to reduce

MONTHS, DIMINISHED BY EXPORTS FOR THE SUCCEEDING MONTH BEET SUGAR AND SUGARS ADMITTED FREE OF DUTY*

2000 pounds)

Cuban sugars				
1919	1920	1921	1922	1923
144,980	157,118	82,427	274,715	226,237
286,571	303,972	261,226	358,270	225,189
189,685	317,029	368,376	476,853	560,272
295,865	265,562	302,401	323,758	343,588
297,138	246,089	215,530	265,249	345,815
1,214,239	1,289,770	1,229,960	1,698,845	1,701,101
229,961	346,954	87,223	336,517	285,839
248,718	362,290	33,705	407,410	209,624
144,694	206,102	197,623	422,525	168,288
291,041	55,011	97,051	168,148	357,193
213,401	21,415	127,588	190,982	270,378
150,327	75,111	170,952	245,826	133,803
32,045	43,754	100,640	145,000	
1,310,187	1,110,637	814,782	1,916,408	
2,524,426	2,400,407	2,044,742	3,615,253	

Beet sugar				
1919	1920	1921	1922	1923
.....	166			
0.6				
.....	156			
.....	6,813	4.0		
.....	127			
.....	8,614			
.....	2,060			
.....	441	3.1		
0.6	18,377	7.1.		

retained for consumption should be considered. Imports for refining (or virtually free because of the drawback. It is necessary, therefore, to deduct exported; but as exports are in terms of refined sugar and imports are in terms imports and exports to the same basis.

periods of recovery, declined through the remainder of 1920 and all of 1921, reaching the lowest point on December 29, 1921, when the c. and f. price, New York, was 1.81 cents per pound.

A study of Table XIV and the accompanying diagram (fig. 7) shows clearly the cause of this decline. It will be seen that in 1919, 1921, and 1922 total importations exceed Cuban importations by only a small margin; but that in 1920 the excess is very great and, furthermore, that the total importations for the first five months of 1920 are larger than for the same period in either 1919 or 1921. These facts indicate that the panicky buying during the spring of 1920 and its normal accompaniment of rising prices had begun to attract imports to such an extent as to overstock the market before the end of May, and that the increased importation, even with high prices, indicating an apparently boundless demand, stimulated importers to place orders not only for Cuban sugar but also for full-duty sugar from all over the world. When the market broke these orders had been placed; and the full-duty sugar, continuing to pour in, caused prices to decline and stocked the country with a rapidly accumulating surplus. Faced by this accumulating surplus, Cuba was unable to dispose of her 1920 and 1921 crops (among the largest in her history); and when the price reached its bottom point of 1.81 cents per pound at the end of December, 1921, and the new-crop sugars of 1922 were beginning to appear on the market, it is estimated that a surplus of over a million tons of old-crop sugars had accumulated in Cuba.

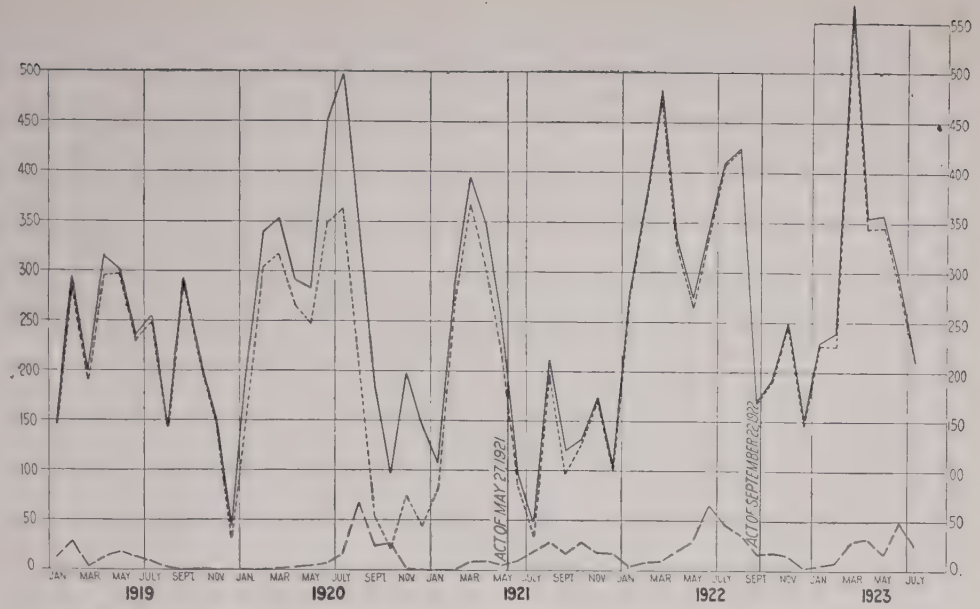


FIGURE 7.—SUGAR IMPORTS RETAINED FOR CONSUMPTION, IN THOUSANDS OF TONS BY MONTHS, FROM JANUARY, 1919, TO JULY, 1923; TOTAL DUTIABLE (full line), CUBAN (dotted line), FREE OF DUTY (dash line).

The declining prices beginning with the end of May, 1920, were bringing increasing disaster to the Cuban producers, to traders, and to some banks which supplied them with credit. A moratorium, declared in the autumn of 1920, prevented failures during that year, but during 1921 many Cuban banks suspended payment and one went out of business. Under these conditions, many of the stronger sugar-producing companies under American management and capital and some of the American banks either purchased the Cuban mills that were no longer in a position to continue in business or assumed the operation of them.

The demoralization brought about by falling prices extended to the domestic industry, especially the Louisiana and beet-sugar interests, and resulted in a demand for increased protection. This demand bore fruit in the provision in the Act of 1921 increasing the rate on Cuban sugar from 1.0048 to 1.6 cents per pound. It will be pertinent to inquire what effect this increase in duty had upon imports, prices, and the domestic output.

The increased rate, however, had no immediate effect upon prices. It thus appears that the Act of 1921 was passed largely at the instance of the Louisiana and beet-sugar producers in the hope of affording them protection under the stress of falling prices. Study of Table XIII and figure 6 shows, however, that the passage of the act afforded them no immediate relief; the sensational decline in prices beginning in May, 1920, continued with little abatement throughout the year. Between two low points,

December 16, 1920, and February 3, 1921, there was a slight rally and from this date to March 24 a more decided rally; but from March 24 to December 29 the trend continued downward, relieved only by slight upward movements in May and July. It is, of course, impossible to state just what would have been the course of prices had there been no change in the tariff in May, but evidence afforded by Tables XIII and XIV and figures 6 and 7 points to an increased burden upon Cuba rather than to a lightened burden upon domestic producers. It will be noticed that, following a slight rally immediately before the passage of the act, the c. and f. prices drop more precipitately than the duty-paid prices, until they are low enough to make the distance between the c. and f. and duty-paid price curves 1.6 instead of 1.0048 cents per pound as it had been before. The year 1921 was a year of acute business depression, and the demand for sugar as for all other commodities was not strong. On the other hand, both the Cuban and domestic crops in 1921 were large, and Cuba was burdened with the surplus stock above mentioned. Banks which had advanced credit to the Cuban growers and manufacturers held much of the Cuban sugar and were forced to sell it at any price. The evidence is, therefore, that for some months after the passage of the act the duty was borne by the Cuban producers without injury to the American consumers or benefit to American producers.

Hence, the demand for a still further increase in duty, resulting in the Act of 1922. Under such con-

ditions it is not surprising that, in spite of the great advance in rate provided in the Act of 1921, the domestic producers were not satisfied and demanded a still further increase; nor is it surprising that the Cuban interests asked for a reduction below the existing rate. The domestic industry, led by the beet and Louisiana interests, asked for a rate of 2 cents against Cuba, the Cuban interests asked for a reduction to 1.4 cents at most, and, if possible, less. The matter was bitterly fought both in the committees and on the floor in Congress, members from sugar-producing States, irrespective, as a rule, of party affiliations, demanding the increased rate, and members from eastern States, especially those in which the refining and Cuban interests were as a rule strong, demanding a reduction. The domestic producers, on the whole, were victorious. True, they did not get the full advance to 2 cents demanded, but, by a close vote, they did get the rate increased from 1.6 to 1.7648 cents per pound against Cuban sugar.

What part does the tariff play in the present price of sugar? The table and the diagram indicate that the increased duty was at once borne by the American consumer. To be more exact, as has been shown by a careful study made by the sugar expert of the United States Tariff Commission, the duty was at first borne by the refiner and some months later was passed on to the ultimate consumer. It will be seen that after reaching the lowest point on December 29, 1921, prices began to rise and, with some recessions, notably one just before the passage of the act, have

continued to rise to the present time (October 1, 1923). Immediately after the passage of the act both c. and f. and duty-paid prices rose, but the duty-paid price rose more rapidly, making the difference between them the new rate 1.7648 instead of the old rate, 1.6 cents per pound.

The fact that the increased rate of 0.1648 of a cent per pound was passed on to the American consumer suggests that at some period between the passage of the Act of May 27, 1921, and that of September 22, 1922, the former increase of 0.6 of a cent per pound was also passed on to the consumer. As stated above, it was at first borne by the Cuban producer; and prices of duty-paid sugar continued to decline after the passage of the act, apparently as rapidly as they would have declined had the act not been passed. But with the coming of 1922 the situation changed. The year proved to be one of general business recovery and of strengthening demand, especially for sugar. In fact, sugar imports broke all previous records, both of sugar retained for consumption and sugar imported for refining and reexport. The accumulated surplus, which had so depressed the market, was all absorbed by June. Moreover, as stated above, the reorganization of the Cuban industry, following the disaster of 1921, had placed it in a much stronger position. All of these factors would tend to put the Cuban producers in a position where they would be able to pass the burden of the duty on to the shoulders of the American consumers.

Since the beginning of 1923 the price of sugar has

continued to advance. The advance has been so great as to excite no little public attention, including a "sugar boycott" by consumers and investigations by governmental agencies. The public excitement was rendered the more intense by the skirmishing for political position by the two great business interests which are in the background of all tariff controversies respecting sugar. Literature emanating from the domestic producers endeavored to place the responsibility on the shoulders of the refining interests and the American investors in Cuban sugar properties; and literature emanating from the latter interests endeavored to place the responsibility on the tariff.

A careful and temperate investigation made by the United States Tariff Commission [1] may be

[1] "As far back as October, 1922, it had become clear that, owing to the heavy sales during 1922, there would be no Cuban carry over into the 1923 crop and even if Cuba produced a large crop in 1923 it would have considerably less sugar available for export than in the year 1922.

"Furthermore, as far back as October 26, 1922, Willett & Gray, Statistical Sugar Trade Journal, issued its first estimate of the world crops for 1922–23. It estimated the United States beet crop at only 650,000 long tons, a sharp reduction from 911,190 for the previous year. . . .

"In the latter part of 1922, there appeared in the press articles indicating a probable shortage for 1923 and discussing the prospects for sugar prices, . . .

"On January 23, 1923, Lamborn & Company, a firm of New York brokers with offices throughout the United States and abroad, published its special study of the world sugar supplies, giving in detail estimates of supply and requirements of raw sugar for all countries of the world for the year 1922–23. This report states, 'in view of the fact that there is not enough sugar available to supply a normal increase in consumption, prices will undoubtedly reach a higher level throughout the year and consumption will be thus reduced. . . .

"On February 9, the Wall Street Journal stated that a considerable drought in eastern Cuba might reduce the crop and that several conditions pointed to higher prices in sugar. On the same day the

accepted as authoritative in this matter. It shows, on the one hand, by reasoning similar to that advanced in this paper, that the duty is included in the price. This does not mean that if the duty were removed the price would immediately be reduced by the full amount of the duty. But it does mean that the price is probably higher, by approximately the amount of the duty, than it would have been had there been no duty, and that, were the duty to be now removed, the price would ultimately be lower by approximately the amount of the duty than it will be if the duty is retained. On the other hand, it makes it clear that for the *advance* in prices since the beginning of 1923 the tariff is in

Associated Press announced that a world sugar shortage for 1923 was indicated in a report on world production and consumption of sugar by the Department of Commerce.

"Later the Secretary of Commerce denied that the report issued by his department indicated a shortage and stated that ample sugar would be available this year for all estimated needs and that there was no cause for alarm in the situation, because of the carry over from the preceding year, which would leave a surplus of 476,000 tons at the end of the year.

"But on the 12th, the firm of Guma-Mejer announced a reduction from an earlier estimate of 4,193,000 tons to 3,800,000 tons.

"During the rest of February and March there were statements and counterstatements by sugar statisticians, Government bureaus, sugar refiners, and the press generally. The National Sugar Refining Company said: 'There will be plenty of sugar for everybody unless there is speculation and everybody tries to buy their summer requirements in the next month or two, in which case there will be much higher prices.' The Federal Sugar Refining Company on the same day announced that their Cuban representative believed there was no reason for changing the 4,400,000-ton estimate of the Cuban crop. Statements similar to the above were made by Willett & Gray and Arbuckle Brothers. . . . On February 16, the firm of Guma-Mejer was quoted as saying that it feared the Cuban crop would fall below 3,800,000 tons."—*The Relation of the Tariff on Sugar to the Rise in Prices, February–April, 1923: U. S. Tariff Commission, 1923.*

The report quotes prices showing the sensitiveness of the market to these estimates, rising when the estimate indicated a shortage and falling when the estimate showed a sufficiency.

no wise responsible. That advance is shown to be due primarily to reports by experts that the supply available for 1923 is not likely to be as large as at first estimated. In other words, the rising prices of 1923 have their bases in conditions of supply and demand. The quantity of sugar available for United States consumers is probably not as great as that available in 1922 (including the million-ton hold-over surplus with which 1922 began), while there is no reason for supposing that the demand for sugar in 1923 will not be at least as strong as in 1922. In order to effect an equalization of supply and demand a higher price is therefore to be expected. This is not to say that there has been no speculation and no concerted action among the Cuban interests to influence the price. But had there been no background in the supply and demand situation, such speculation and cooperation could hardly have been effective over any considerable period of time.

2. Effects of the Acts of 1921 and 1922 upon Imports

Having attempted by statistical methods to segregate the effects of the tariff acts of 1921 and 1922 upon prices, we will next attempt to discover by similar methods their effect upon imports of sugar. It was shown in Chapter V (p. 120) that the normal effect of an increase in duty was to diminish imports. To what extent, if any, is this result observable in the months which have passed since the Acts of 1921 and 1922 went into effect?

Strengthening demand has obscured the effect of recent increases of rate upon imports. The marked falling off in imports in 1921 might be attributed to the increase in duty of that year. It is doubtful, however, whether the tariff had much to do with it. As was noted in the price study, prices continued to decline after the passage of the act, the drop in the c. and f. price being greater than the drop in the duty-paid price by the amount of the increase in duty. Hence, the price situation offered no obstacle to imports. Again, imports in 1920 were abnormally large. The stocks accumulated in the United States from these imports would tend to reduce imports in 1921, as would also the general business depression of that year. That monthly imports after May should average less than for the first five months of the year is entirely normal.

The same phenomenon is observable in 1919, 1920, and 1922. In 1919 the average net monthly imports for the first five months were 251,000 tons against 191,100 tons for the last seven months. In 1920 they were 294,600 against 277,100;[1] in 1921 they were 276,200 against 126,600; in 1922 they were 345,800 against 277,000; and for the first five

[1] The year 1920 was abnormal. The rapid increase in imports began much as usual but was soon checked by the unprecedented rise in prices. When the market broke in June, the rise in imports continued and did not reach its culmination until July. During the panicky condition of the market sugar had been ordered from all over the world, and much of it did not arrive until several weeks later. Nearly all of this full-duty sugar would not normally have been ordered at all. This situation produced the double-peaked curve shown in the diagram (fig. 7) for 1920, with the period of maximum importation some two months latter than normal.

months of 1923 they were 349,806 against 253,894 for the six months following.

However, it would be going too far to say that the Act of 1921 had no effect upon imports. While average monthly imports fell off in all of the years, as above shown, the falling off was much more marked in 1921 than in any of the other years. In 1919 average monthly imports for the last seven months were 76 per cent of those for the first five months; in 1920, 94 per cent; in 1921, 46 per cent; in 1922, 80 per cent. The diagram shows a very great and abrupt falling off immediately after the passage of the act, followed by a general upward trend for the remainder of the year. In the other years the falling off near the end of the spring months is not so great, and the general trend for the remainder of the year is downward. It will be noticed that imports were heavy in April but fell off in May, even before the act was passed. The effect of the duty, therefore, appears to have been not so much to diminish imports for the year as a whole as to concentrate them more than is usual at the beginning and end of the year. The fact that in the following year imports broke all previous records, even though during the last three months they entered over an even higher rate of duty, shows that as yet the Acts of 1921 and 1922 have had little effect in keeping out foreign sugar.

It may be argued on grounds of theory that imports would have been even greater had there been no increase in duty, but this, of course, can not be shown by statistical methods.

3. Effects of the Acts of 1921 and 1922 upon Revenue

Since imports, as shown in the last paragraph, have been little effected, the revenue has been improved virtually in the same proportion as the increase in rate.

4. Effects of the Acts of 1921 and 1922 upon Domestic Production

According to the principles developed in Chapter V (p. 121) the normal effect of an increase in duty should be to stimulate domestic production. To what extent has this effect been realized?

It is too soon to obtain statistical evidence as to the increase in domestic production normally to be expected. Since for a number of months the Cuban producers bore the burden of the increased duty of the Act of 1921 and prices remained about what they would have been had the act not been passed, it may confidently be said that during this period the domestic producers received little or no benefit, other than perhaps more confidence for the future, from the added protection. At some period, however, between January and September, 1922, the Cubans were apparently in a sufficiently strong position to pass the duty on to the American consumers. It is probable that at the present time (October, 1923) domestic producers receive a price higher by the full amount of the duty than they would receive had there been no duty. The logical result, therefore, should be, if the rate remains unchanged, that a greater proportion of sugars

derived from domestic sources and a smaller proportion of foreign sugars will figure in the total domestic consumption than if the duty had not been raised.

This is not to be understood, however, as a prophecy that the actual proportion will increase beyond what it was under the Act of 1913 up to 1917. It is not unlikely that the opening up in Cuba of the eastern region under efficient American management, coupled with the strong American demand for sugar, may retain or even increase the actual proportion of Cuban sugar in American consumption. It will be noticed (fig. 4, p. 164) that the proportion of consumption derived from domestic sources reached a maximum in 1917. It had fallen off greatly by 1920, had gained in 1921, but had again fallen off in 1922.

It is too soon, however, to expect any considerable amount of evidence as to the effect of recent tariff legislation upon domestic production in the shape of output statistics. The assembling of capital and labor, the erection of new plants, and the growing of crops require several years before tangible results can be obtained. Reports are current in trade circles of increased activity in the direction mentioned, but reliable data are not yet available.

IV. EFFECT OF CHANGES IN THE DUTY ON RAW SUGAR UPON THE PRICE OF REFINED SUGAR

Practically all the imports of sugar are of raw sugar, while nearly all of the consumption is of refined sugar. The difference between the price of

refined sugar and the price of duty-paid raw sugar is known as the refiner's margin and is made up of the costs and profits in refining. The costs include the usual labor, material, depreciation, interest, and overhead expenses incident to all manufacturing operations, none of which is greatly affected by the price of raw sugar. But they also include a cost that is due to the fact that it takes about 1.07 pounds of raw sugar to produce 1 pound of refined sugar, and this cost is affected by the price. An increase in the price of raw sugar brought about by an increase in the duty or otherwise will increase the price of refined sugar by more than the same amount. An increase of 1 cent, for example, in the price of raw sugar should increase the price of refined sugar by 1.07 cents (but see footnote, p. 105) plus the interest on 1.07 cents for the time that the investment in raw sugar is tied up before the refined sugar manufactured from it is sold. Assuming this period of time to be a month, then an increase of 1 cent in the price of raw sugar should increase the price of refined sugar 1.07535 cents per pound.

The actual prices of refined granulated corresponding to quotations for raws show a considerably wider fluctuation than is to be accounted for by the above explanation. The difference between the low and high prices for raws during the years 1921 and 1922 was about 2.8 cents. On the above theory the difference between the low and high price for refined granulated should have been about 3 cents. The actual difference, derived from a process of averaging the refiner's margin, was about 3.4 cents.

CHAPTER VII

TRANSPORTATION CHARGES AS AN ELEMENT IN PROTECTION

When an article of merchandise has been landed at a United States port and the duty has been paid it has by no means reached the final consumer. The United States covers an immense area and the cost of transportation from the port of entry to a consumer remote from that port affords considerable protection to a domestic producer whose plant is near the consumer. In arriving at an equitable duty for the domestic-sugar industry the incidental protection afforded by transportation costs should be taken into account.

This incidental protection applies to regions of domestic production not only as against foreign sugars but also as against domestic sugars from other regions. In each region the quantity of sugar produced exceeds the quantity that can be consumed in the immediate vicinity of the factories; and hence producers, as the output of the region increases, are constantly pushing out into more and more remote markets. In a very rough way costs of transportation increase with distance; hence, within a certain radius, costs of transportation to these markets may be so much less than from other regions that the freight differentials act as a pro-

hibitory tariff against their sugars. Producers within that region come to regard it as "their territory."

Railroad rates are based partly on mileage and partly on the principle of providing access to great consumption areas. Costs of transportation vary only roughly with mileage. The rate between terminals may not be less than the rate between intermediate points, but, subject to this provision, the mileage factor plays a secondary part. Consumption areas center in great cities, which absorb quantities of sugar entirely disproportionate to their areas and which, moreover, serve as distributing centers of sugar for large areas surrounding them. Hence, if a region of production is to dispose of its output it must have access to these great centers of consumption, and in order that it may have access it must have rates from carriers that will enable it to compete with other regions whose sugars enter the same market. In order to secure traffic it is for the interest of carriers to grant low rates to such centers, often not exceeding or only slightly exceeding the rates to points involving much less mileage but of less commercial importance. The "territories" appertaining to each region, therefore, overlap in large competitive areas. In the Chicago market, for example, foreign sugars from Cuba actively compete with domestic sugars from Porto Rico, Louisiana, beet-sugar States, and even the Hawaiian Islands.

Railroad tariffs are adjusted by the Interstate Commerce Commission largely with reference to competitive conditions. Before a carrier can change its rates

it must submit its proposed tariff to the Interstate Commerce Commission; and as a change in sugar rates in one region vitally affects the interests of sugar producers, not only in that region but in other regions also, such a proposed change becomes a matter of active controversy between the interests affected, to be adjusted only after a full hearing and a careful study by the commission. For example, if the eastern carriers propose a lowering of the rate from New York and Philadelphia to Chicago, the proposed change will be resisted by the Louisiana producers unless a proportionate decrease is made in the rate to Chicago from New Orleans. It will also affect the competitive position of beet-sugar producers in the Chicago market and of cane-sugar producers in the Hawaiian Islands. The commission will be called on to adjudicate between all these conflicting interests.

The adjustment of rates as between competing domestic producers is, however, a matter foreign to this discussion. In what follows, freight rates will be discussed only in so far as they affect the relative competitive positions of foreign and domestic sugars.

The amount of protection derived from freight differentials depends on the location both of the producer and of his market. While railroad tariffs may in some instances resemble customs tariffs in affording protection to domestic industries, they differ from them in protecting unequally different regions, different establishments, and even different portions of the output of the same establishment. Indeed, the

rate may operate as a protective barrier in favor of the foreign as against the domestic producer. A customs duty of 1 cent per pound affords a protection of 1 cent per pound on every pound of domestic sugar marketed in United States territory, but the amount of protection afforded by a freight rate depends on the location of the producer and the location of his market and hence may be different for the different portions of his output sold in different markets.

For example, the cost of transportation from Cuba to San Francisco in conjunction with the present customs tariff is sufficient to exclude Cuban sugar from Pacific coast markets; and the costs of transportation from producing centers in beet-sugar States to seaboard cities is sufficient, in spite of the protection afforded by the customs tariff, to exclude beet sugar from all Atlantic coast markets. Normally, little beet sugar passes east of the Buffalo-Pittsburgh line. Again a beet-sugar producer in Fort Collins, Col., obtains from freight differentials a much greater amount of protection on the part of his output which he markets in Denver than on the part which he markets in Chicago. Because of the above facts it is difficult to determine just how much protection any region of domestic production, taken as a whole, obtains from freight differentials. To ascertain this figure it would be necessary not only to have a complete table of freight rates on sugar from producing points in that region to their customary markets, together with rates on foreign sugars to those markets, but also to know to which

market every shipment from every individual producer was made.

Because of the dominance of the New York market, transportation charges are less of an impediment to the movement of sugars west and north than east and south. Another factor having an important bearing on this question is the practice of fixing prices in United States markets by adding to the New York price the freight rates from New York or from New Orleans to those markets.[1] So long as this practice continues a high freight rate between seaboard or Gulf points and beet-sugar territory is less of a hindrance to sugars moving from the seaboard or Gulf to the interior than to sugars moving from the interior towards the seaboard or Gulf. It is true that the costs of marketing Cuban or Porto Rican sugar at western points are greater than at the seaboard by the freight charge from New York or from New Orleans; but as the price is also greater by the same amount, the seller is put to no further disadvantage than that arising from the restriction of demand caused by the higher price.

Beet-sugar moving eastward or southward, on the other hand, is confronted not only with a constantly increasing freight charge, but also with a constantly diminishing price. In brief, the present method of basing sugar prices makes it easier for seaboard sugars to "invade" beet-sugar territory than it is for beet sugars to "invade" the seaboard. Suppose that the marginal cost and price of refined granulated in New Orleans is 7 cents per pound, then this

[1] This practice appears to be breaking down. (See pp. 207–09.)

sugar can be marketed in Chicago as profitably as in New Orleans, for though the cost of marketing is increased 54 cents per 100 pounds (the rate from New Orleans to Chicago) the price also is increased 54 cents per 100 pounds. On the other hand, Michigan sugars can be profitably marketed in Chicago up to a marginal cost of 7.54 cents per pound minus the freight charge from the factory to Chicago, about 30 cents per 100 pounds. That is, Michigan sugar produced at a cost as high as 7.24 cents per pound can be profitably marketed in Chicago. But to move Michigan sugar to New Orleans would cost 84 cents per 100 pounds and on arriving would sell for only 7 cents per pound. Hence, Michigan sugar could only be profitably marketed in New Orleans, if the cost of production were not greater than 6.16 cents per pound.

Nevertheless, so long as markets can be found in the west and middle west, freight rates from the seaboard protect the beet-sugar producers. In the example just given it was shown that sugar could be profitably shipped to Chicago from Michigan points when the marginal cost was as high as 7.24 cents per pound, but could not be profitably shipped to Chicago from Louisiana when the marginal cost in New Orleans was over 7 cents per pound. That is, the freight differential affords protection to Michigan producers to the extent of 0.24 of a cent per pound even against Louisiana producers. Against foreign producers the protection is greater. Such sugars must pay freight charges to New Orleans. But to obtain this protection the market must be relatively

near. The same example also shows that the advantage rapidly disappears and becomes negative as the sugar is moved south or east.

Hence, to estimate the freight protection to beet sugar the freight rates and the nearness to markets must both be known. Typical freight rates are shown in Tables XV and XVI.

TABLE XV.—Ocean Rates, 1921–22 Crop, for Sugar between the Points Designated *

(In cents per 100 pounds)

From	To New York or Philadelphia	To Galveston	To New Orleans	To Boston	To San Francisco
Cuba, north coast	16–20	15.5–20	13.5–18	19–22	
Cuba, south coast	18–22	17.5–22	15.5–20	21–24	
Porto Rico	15	....	....	15	
Hawaiian Islands	....	....	....	....	20–33.8

* Figures furnished to the Institute by the United States Tariff Commission. As much ocean freight is carried on charter rates, the rate actually paid often differs from the published rate, hence the range of rates between identical points shown in the table. The lower figures represent rates ascertained to have been actually paid. The Federal Reporter (Nov. 1, 1923) quotes the rate from Cuba, north coast, to New York at 19 and 20 cents; to Galveston, 19 and 20 cents; to New Orleans, 17 and 18 cents; to Boston, 21 and 22 cents. Rates from the south coast, 2 cents higher in each case.

The Interstate Commerce Commission gives the rates from the Hawaiian Islands to San Francisco $5 per ton and to New York $11 per ton.—*Sugar Cases of 1922, p. 458, 1923.*

An average furnished by the Tariff Commission of rates actually paid by 11 companies taken at random and reduced to a 96° centrifugal basis from Hawaiian ports to San Francisco in 1922 is 33.8 cents per 100 pounds. Hawaiian sugar averages above the 96° centrifugal test.

Assuming that favorably situated markets can be found, the protection to the beet-sugar industry from the freight differentials is substantial and has increased during the past decade. All branches of the domestic

industry regard access to the Chicago market as vital to their prosperity. Here beet sugar from near-by States meets in competition with foreign sugars, beet sugars from the West, and domestic cane sugars from Porto Rico, Louisiana, and the Hawaiian Islands. To estimate the freight protection enjoyed by the domestic beet-sugar industry, therefore, attention should first be directed to the Chicago market. Freight differentials to Chicago from typical points are shown in Table XVII.

From Table XVII it appears that beet-sugar producers even as far west as Idaho obtain some protection on the portions of their crop marketed in Chicago—about 40 cents from Michigan points, 14 cents from Colorado points, and half a cent from points in Utah and Idaho. These figures, however, by no means represent the full measure of freight protection enjoyed by these sugars. They only represent the protection applying to such portions of the output as are marketed in Chicago. On portions sold in nearer markets the protection is much greater. For example, on Colorado sugars marketed in Denver the freight protection is $102\frac{1}{2}$ cents and on Utah and Idaho sugars marketed in the same city 62 cents. California beet sugars are shown to be at a disadvantage of 15 cents per 100 pounds in Chicago; but westward from Chicago the disadvantage progressively diminishes and ultimately disappears. By the time Denver is reached the disadvantage has become an advantage of $31\frac{1}{2}$ cents per 100 pounds and in California itself no foreign sugars are found.

TABLE XVI.—Railroad Rates * on Sugar, 1913

(In cents per

From	To Chicago				To Detroit			
	1913		1923		1913		1923	
	Min. wt.	Rate	Min. wt.	Rate	Min. wt.	Rate	Min. wt.	Rate
New York	(*d*)	26	(*e*)	56½	(*d*)	20	(*e*)	44
San Francisco	(*a*)	60	(*c*)	85	(*a*)	73 †	(*c*)	112½ *h*
Los Angeles	(*a*)	60	(*c*)	85	(*a*)	73 †	(*c*)	112½ *h*
Ogden, Utah	(*c*)	50	(*a*)	69½	(*b*)	63 †	(*a*)	97 *h*
Salt Lake City, Utah	(*c*)	50	(*a*)	69½	(*b*)	63 †	(*a*)	97 *h*
Idaho Falls, Idaho	(*c*)	50	(*a*)	69½	(*b*)	63 †	(*a*)	97 *h*
Sugar City, Idaho	(*a*)	25	(*a*)	69½	(*a*)	38 †	(*a*)	97 *h*
Ft. Collins, Colo	(*a*)	25	(*a*)	56	(*a*)	38 †	(*a*)	83½ *h*
Brush, Colo	(*d*)	35	(*a*)	56	(*d*)	48 †	(*a*)	83½ *h*
Owosso, Mich	(*a*)	11	(*e*)	29	(*d*)	8½	(*e*)	19
Saginaw, Mich	(*d*)	11	(*e*)	30	(*d*)	10	(*e*)	21
New Orleans	(*d*)	23	(*a*)	54	(*d*)	23	(*a*)	54

* The minimum rates are given. Higher rates for lower minimum weights

† Figures furnished to the Institute by the Interstate Commerce Com-

a 60,000 pounds.

b 36,000 pounds.

c 80,000 pounds.

d 33,000 pounds.

e 40,000 pounds.

AND 1923, BETWEEN THE POINTS SPECIFIED †

100 pounds)

To St. Louis				To St. Paul-Minneapolis				To Denver			
1913		1923		1913		1923		1913		1923	
Min. wt.	Rate	Min. wt.	Rate	Min. wt.	Rate	Min. wt.	Rate	Min. wt.	Rate	Min. wt.	Rate
(*d*)	25	(*e*)	66	(*d*)	33	(*a*)	78	(*b*)	87 [b]	(*e*)	149 [f]
(*a*)	60	(*c*)	79	(*a*)	55	(*a*)	88½	(*a*)	55	(*a*)	86½
(*a*)	60	(*c*)	79	(*a*)	55	(*a*)	88½	(*a*)	55	(*a*)	86½
(*a*)	50	(*a*)	69½	(*a*)	50	(*a*)	76½	(*d*)	55	(*a*)	56
(*a*)	50	(*a*)	69½	(*a*)	50	(*a*)	76½	(*a*)	50	(*a*)	56
(*a*)	50	(*a*)	69½	(*a*)	50	(*a*)	76½	(*a*)	50	(*a*)	56
(*a*)	25	(*a*)	69½	(*a*)	25	(*a*)	76½	(*d*)	55	(*a*)	56
(*a*)	25	(*a*)	56	(*a*)	25	(*a*)	63	(*d*)	10	(*a*)	15½
(*d*)	30	(*a*)	56	(*d*)	30	(*a*)	63	(*d*)	10	(*e*)	15½
(*d*)	16	(*e*)	36	(*d*)	18	(*e*)	48	(*b*)	78 [g]	(*e*)	131 [g]
(*d*)	16	(*e*)	37½	(*d*)	18	(*e*)	48	(*b*)	78 [g]	(*e*)	132 [g]
(*d*)	17	(*a*)	53½	(*d*)	30	(*a*)	63	(*d*)	62	(*a*)	102

are provided in most cases.
mission.

[f] Mississippi river combination.
[g] Chicago combination.
[h] Chicago combination, minimum weight end of Chicago, (*e*).
[i] Chicago combination, minimum weight end of Chicago, (*d*).

TABLE XVII.—Freight Differentials in the Chicago Market between Cuban Sugars and Domestic Sugars from the Points Specified, 1913 and 1923 *

(In cents per 100 pounds)

Source of domestic sugar	Net freight protection in the Chicago market	
	1913	1923
Michigan points:		
Saginaw	24	40.0
Owosso	24	41.0
Colorado points:		
Ft. Collins	10	14.0
Brush	0	14.0
Utah points:		
Ogden	−15	0.5
Salt Lake City	−15	0.5
Idaho points:		
Idaho Falls	−15	0.5
Sugar City	10	0.5
California points:		
San Francisco	−25	−15.0
Los Angeles	−25	−15.0
Hawaiian Islands	−50	−40.0
New Orleans	12	16.0

* In obtaining the above differentials the rate from Cuba to Chicago for 1913 was obtained as follows: A rate of 11.3 cents was assumed as the rate from Cuba to New Orleans.—*The Cane Sugar Industry, Dept. Comm. Misc. Ser. 53, p. 492, 1917.* As about 107 pounds of raw sugar must be shipped to New Orleans for every 100 pounds of refined shipped from New Orleans to Chicago, this rate was multiplied by 1.07, giving approximately 12 cents. To this was added 23 cents, the all-rail rate to Chicago, giving 35 cents. For 1923 the rate from Cuba to New Orleans was assumed to be 15 cents. This multiplied by 1.07 gives approximately 16. Adding 54 cents (the rate from New Orleans to Chicago), a rate of 70 cents is obtained.

Obviously, by marketing as large a portion of their product as possible in the immediate vicinity of their plants and, if moving their sugars at all by moving them to the west and north rather than to the south and east, beet-sugar producers can gain the maximum advantage from freight differentials and from the practice of basing local prices on the New York price.

Tables XVI and XVII give figures for both 1913 and 1923 and show clearly that the increase in freight rates during the past decade has resulted in an increase of freight protection as follows: in the Chicago market from 24 to 40 and 41 cents for Michigan points; 0 and 10 cents to 14 cents for Colorado points; 10 cents advantage or 15 cents disadvantage to half a cent advantage for Utah and Idaho points; and diminution of disadvantage from 25 to 15 cents for California points. For other markets than Chicago, gains have been similar.

Beet-sugar territory is capable of absorbing the beet sugar grown therein. It will be remembered that the advantage to be obtained from freight differentials depended not only on the differentials but also on the possibility of marketing the product in relatively near-by regions. Table XVIII throws light on this aspect of the question.

The crop year 1922–23 was a year of much greater consumption and much smaller production than the preceding year; hence the consumption surpluses show very much greater in 1922–23, totaling 1,308,346 tons in 1922–23 against 619,833 tons in 1921–22. The average, which probably more nearly

TABLE XVIII.—Production and Estimated Consumption in and for an Average

(In

State	Population 1920 Census	1921–22				[a] Consumption
		[a] Consumption	Production	Production surplus	Consumption surplus	
California	3,426,861	144,785	171,301	26,516	....	176,483
Colorado	939,629	39,699	294,887	255,188	....	48,391
Idaho	431,866	18,246	56,727	38,481	....	22,241
Illinois	6,485,280	274,003	.....	....	274,003	333,992
Indiana	2,930,390	123,809	3,221[c]	....	120,588	150,915
Iowa	2,404,021	101,570	10,736[c]	....	90,834	123,807
Kansas	1,769,257	74,751	8,588[c]	....	66,163	91,117
Michigan	3,668,412	154,991	122,291	....	32,700	188,923
Minnesota	2,387,125	100,856	8,052[c]	....	92,804	122,937
Montana	548,889	23,191	21,420[c]	....	1,771	28,268
Nebraska	1,296,372	54,772	105,302	50,530	....	66,763
Nevada	77,407	3,270	.....	....	3,270	3,986
North Dakota	646,872	27,330	.....	....	27,330	33,314
Ohio	5,759,394	243,334	25,918	....	217,416	296,609
Oregon	783,389	33,098	.....	....	33,098	40,345
South Dakota	636,547	26,894	.....	....	26,894	32,782
Utah	449,396	18,987	155,775	136,788	....	23,144
Washington	1,356,621	57,317	3,864[c]	....	53,453	69,866
Wisconsin	2,632,067	111,205	14,106	....	97,099	135,551
Wyoming	194,402	8,214	18,301[c]	10,087	....	10,012
Total	38,824,197	1,640,322	1,020,489	....	619,833[b]	1,999,446

[a] Obtained by multiplying the State populations by the United States per
[b] Net total.
[c] Estimated

BEET-SUGAR TERRITORY FOR THE YEARS 1921–22 AND 1922–23 OF THESE YEARS

tons)

1922–23			Average 1921–22 and 1922–23			
Production	Production surplus	Consumption surplus	Consumption	Production	Production surplus	Consumption surplus
72,000	.....	104,483	160,634	121,650	.....	38,984
183,000	134,609	.....	44,045	238,944	194,899	
41,000	18,759	.....	20,243	48,863	28,620	
.....	.....	333,992	303,998	.....	.....	303,998
3,000[c]	.....	147,915	137,362	3,110	.....	134,252
10,000[c]	.....	113,807	112,688	10,368	.....	102,320
8,000[c]	.....	83,117	82,934	8,294	.....	74,640
86,000	.....	102,923	171,957	104,146	.....	67,811
7,500[c]	.....	115,437	111,896	7,776	.....	104,120
20,000[c]	.....	8,268	25,729	20,710	.....	5,019
85,000	18,237	.....	60,768	95,151	34,383	
.....	.....	3,986	3,628	.....	.....	3,628
.....	.....	33,314	30,322	.....	.....	30,322
27,000	.....	269,609	269,971	26,459	.....	243,512
.....	.....	40,345	36,722	.....	.....	36,722
.....	.....	32,782	29,838	.....	.....	29,838
118,000	94,856	.....	21,066	136,888	115,822	
3,600[c]	.....	66,266	63,591	3,732	.....	59,859
10,000	.....	125,551	123,378	12,053	.....	111,325
17,000[c]	6,988	.....	9,113	17,650	8,537	
691,100	.....	1,308,346[b]	1,819,884	855,794	.....	964,089[b]

capita, which was 84.5 in 1921 and 103.2 in 1922.

represents normal conditions, shows a total of 964,089 tons. Nevertheless, both years show a decided consumption surplus not only in the territory as a whole but also in all of the States taken separately, except in Colorado, Idaho, Nebraska, Utah, and Wyoming, and, in 1921–22, in California. This would indicate the possibility of disposing of the product of the factories in near-by markets, and hence of obtaining the full measure of protection resulting from freight differentials in most cases, were it not for a disturbing factor.

Hawaiian and some Philippine sugar must find a market in this territory, thus stimulating active competition. In addition to the beet sugar produced in the region covered by the table, large quantities of other domestic sugars must there find their market. In 1921–22 there were received in the port of San Francisco 386,439 tons of Hawaiian and 22,932 tons of Philippine sugar and in 1922–23, 518,511 tons of Hawaiian and 45,774 tons of Philippine sugar.[1] All of this sugar must be absorbed and hence added to the "production" column shown in the table. The total production thus becomes 1,429,860 for 1921–22, and 1,255,385 for 1922–23, the average being 1,342,622; and the consumption surplus is reduced to 210,462 in 1921–22 and to 744,061 in 1922–23, the average being 477,261. Besides the Hawaiian and Philippine sugars a considerable amount of Louisiana sugar and perhaps some Porto Rican sugar moves north into this region; and all of these

[1] Weekly Statistical Sugar Trade Journal, p. 11, January 4, 1923. Figures first reduced to short tons and then to a refined-sugar basis.

domestic sugars compete throughout a considerable part of the region with foreign sugars moving west and north from the seaboard and Gulf. The whole region, therefore, is one of active competition, and in the struggle to find a market for their sugars the producers of domestic beet sugar doubtless lose some of the advantage which should accrue to them. Nevertheless, so long as the price is fixed in these markets by the seaboard price plus freight there is *prima facie* evidence that protection arising from freight differentials is still enjoyed by beet-sugar producers, though they may not be able to market all of their product to the greatest possible theoretic advantage. Moreover, market quotations do not necessarily represent prices actually paid, and in regions where competition is most active price cutting doubtless occurs.

Under stress of domestic competition the custom of basing prices throughout the country on the New York price appears to be breaking down. The quantity of sugar produced in California and entering California from the Hawaiian Islands is greatly in excess of the quantity that can be consumed in that State or even in all the Pacific Coast States combined. The excess above the combined consumption of California, Washington, and Oregon was about 349,336 tons in 1921–22 and 353,191 tons in 1922–23. This sugar must move eastward to find a market; and, as in each of the States of Idaho, Utah, Colorado, Wyoming, and Nebraska there is also a production surplus (491,074 tons in 1921–22; 273,449 tons in 1922–1923; average 382,261 tons), the com-

bined volume of all these sugars moves still farther eastward and finds its chief outlet in the Chicago market. It is estimated that 30 per cent of the entire Hawaiian crop is marketed in Chicago. In Chicago this sugar from the west meets with sugar from Michigan, Louisiana, and Cuba. As a result, competition is keen in the Chicago market and in the entire region west of Chicago to the Pacific coast. During the last two years the California and Hawaiian Sugar Refining Corporation and the Western Sugar Refinery have been quoting prices in Chicago at and sometimes even below the New York price and in San Francisco at prices only slightly above the New York price.

Beet-sugar companies also have been cutting prices for the 1923–24 crop much below the customary differential of about 0.2 of a cent below cane sugar in the same market. While cane-sugar quotations in New York have been running at from 8.75 to 9.25 cents per pound, beet sugar in markets of the middle west has been quoted at from 8.4 to 8.7 cents per pound.

This breaking down of a long-established custom may be temporary or it may be permanent. It is prejudicial to the interests of domestic producers to the extent that they get lower prices in western markets than under the former régime. It does not, however, affect their position with respect to Cuba so far as the protection enjoyed from freight differentials is concerned. It still costs the Cuban producer 40 cents per 100 pounds more than the Michigan producer to enter the Chicago market.

Whatever were the marginal costs in Michigan and Cuba before, both will be lowered. Their relation to each other will be the same as before. In one respect, however, there will be a difference. Freight charges will no longer offer a greater impediment to sugars moving east and south than to sugars moving north and west.

Beet-sugar production in California is declining. The output reached a maximum of 236,322 tons in the crop of 1916–17. From that date to the present time the yearly output in tons has been as follows:

1916–17	236,322
1917–18	209,325
1918–19	122,795
1919–20	131,172
1920–21	167,997
1921–22	171,301
1922–23	80,180
1923–24 (est.)	69,000

The reason for this decline is partly the severe competition with Hawaiian sugar just described, partly the ravages of insect pests, and partly the high value of California lands for other crops, this last making it necessary to pay farmers much higher prices to induce them to raise beets than are paid elsewhere. In 1922 most contracts provided for a minimum basic price for beets of $7 per ton in California; $5 in Colorado, Nebraska, Ohio, and Utah; $5.50 in Idaho and Michigan; and $6 in Wisconsin.[1] The average farm price

[1] Beet Sugar Acreage and Price: U. S. Dept. Agri., Bur. Agri. Economics Bull., July 10, 1922.

paid for beets for the three years 1920, 1921, and 1922 was: in California, $9.80 per ton; Colorado, $7.85; Idaho, $7.87; Michigan, $7.28; Nebraska, $7.85; Ohio, $7.15; Utah, $7.53; Wisconsin, $7.72; other States, $8.00.[1] It should be kept in mind, however, in using these averages that a higher price may be due in part to the sugar content of the beets as well as to competitive conditions.

A rough estimate of the protection derived from freight differentials by the beet-sugar industry as a whole outside of California is about one-third of a cent per pound. California beet-sugar producers obtain comparatively little benefit from freight differentials. In the region where benefit from this source should normally be greatest they encounter such severe competition from Hawaiian and Philippine sugars as largely to offset the advantage due to their location; and as their sugars move eastward this kind of an advantage rapidly disappears.

With respect to other regions of beet-sugar production no figure pretending to scientific accuracy can be given for the reasons already explained. Michigan producers probably enjoy on the greater part of their output a freight differential of not far from 0.4 of a cent per pound. For Colorado producers, the advantage varies from 0.14 of a cent on the sugars marketed in Chicago to 1.025 of a cent per pound on the sugars marketed in Denver. For Utah and Idaho producers the

[1] Preliminary Beet Sugar Report, 1922, U. S. Dept. Agri., Bur. Agri. Economics, December 15, 1922.

advantage varies from 0.005 of a cent per pound on the sugars marketed in Chicago to about 1.5 cents per pound on sugars marketed at near-by points. An estimate based on the consumption in near-by territory as compared with the tonnage which must be moved gives for Colorado a net advantage of 0.3 of a cent and for Utah and Idaho a net advantage of 0.33 of a cent. A rough estimate of the average for all these States weighted in proportion to their respective outputs gives 0.33 of a cent per pound. Production in all other States is relatively small and their inclusion would not perceptibly change the result.

The advantage due to freight differentials is partly offset by the preference in price given to cane sugar in the same market. It has been noted (p. 115) that custom has established a price for beet sugar about 0.2 of a cent per pound lower than the price for cane sugar in the same market. Hence the advantage which beet-sugar producers gain in freight differentials, because of their location, is partly offset by their disadvantage by the lower market valuation of their sugar.

Other branches of the domestic sugar industry gain little or no advantage from freight differentials. Porto Rico receives no benefit from this source. Her sugars both with respect to ocean and inland transportation are on substantially the same basis as Cuba's.

Louisiana's advantage consists only in the cost of transportation (0.135 to 0.18 of a cent per pound)

from Cuba to New Orleans.[1] Thereafter, the sugars are on the same basis.

The Hawaiian Islands also gain little if anything from freight differentials. It may be assumed that they market about 40 per cent of their crop in the Pacific States, where the advantage is about 0.6 of a cent per pound (assuming the San Francisco price to be 0.1 of a cent above the Chicago price); and 60 per cent in Chicago and territory governed by the Chicago prices, where the disadvantage is 0.4 of a cent. On this assumption the freight differential may be regarded as nil.

With the natural growth in population the Pacific States may be expected to absorb a larger proportion of the Hawaiian output, especially as production in the Hawaiian Islands has about reached its limit and beet-sugar production in California appears to be declining.

[1] That is, against foreign sugars. Louisiana, of course, receives considerable advantage over competing domestic sugars at near-by points.

CHAPTER VIII

ARGUMENTS FOR AND AGAINST A DUTY ON SUGAR

In this chapter will be presented the leading arguments for and against a duty on sugar. Some of these are of a comprehensive character and relate to commodities in general. Such arguments necessarily raise the whole question of the wisdom of maintaining a customs tariff for the purpose of protecting a domestic industry. Other arguments relate specifically to sugar.

I. ARGUMENTS AGAINST A DUTY

Protection is wasteful of human effort. The fundamental argument against a duty on sugar is the general argument against protection advanced by leading English and American economists. In its popular form this argument is expressed in terms of a money burden upon consumers. In order to protect a domestic industry a duty is imposed which raises the price of the commodity in question. This increase in price, so far as the imported portion of the domestic supply is concerned, goes to the United States Treasury and may be justified as a tax. But the same high price applies also to the domestic product. It brings no revenue to the

Treasury and is an unnecessary burden upon consumers who, but for the duty, might have obtained the article from foreign producers at a lower price.

More philosophically, the argument is that brought out in Chapter IV (pp. 98–100). To compel the people by means of a protective tariff to produce things themselves which they might obtain more advantageously through exchange with a foreign country is wasteful of human effort.

Protection breeds international ill-will. The recent increase in the sugar duty has aroused great bitterness in Cuba against the United States, and this is only one form of the normal effect to be expected from a high tariff. Even were the argument sound that the United States is benefited by imposing restrictions upon imports from other countries, such benefits will clearly be neutralized if other nations impose similar restrictions upon imports from the United States. Action in this direction by one nation is certain to lead to retaliation by others. Such retaliation leads to counter retaliation and, with the augmenting ill will, world peace is endangered. In the present disorganized condition of the world following the Great War, legislation calculated to intensify rather than to allay international animosities seems peculiarly ill timed.

Protection is prejudicial to the interests of the exporting industries. It is well established both by theory and statistics that the international remittances of a country balance one another. A protective tariff tends to diminish imports and hence tends to diminish the remittances which the

United States must make to foreigners. The result will be that foreigners will diminish their purchases in the United States and that domestic industries which are on an export basis will suffer. This may or may not show with respect to the country against which a specific item in the tariff is levied but it will show in the totals for all foreign trade. For example, a substantial reduction in the sugar duty would undoubtedly stimulate exports of sugar from Cuba to the United States. As a result of the increased exports, Cuba would have increased credits in the form of dollar exchange with which to make purchases. The purchases might be made directly in the United States or in England, France, or some other country. But wherever the purchases were made the seller would hold this dollar exchange and ultimately it would be used for purchases in the United States. That is, the increased imports of sugar from Cuba would ultimately be reflected in increased exports either to Cuba or some other country.

By the same reasoning it can be shown that raising the duty on sugar will ultimately result in diminished exports to Cuba or to some other country and hence will be prejudicial to the interests of such domestic industries as are on an export basis.

II. ARGUMENTS IN FAVOR OF A DUTY

The arguments just advanced indicate as a wise policy an immediate repeal of the duty. Let sugar be admitted free of duty from whatever source

derived, let so much of the domestic industry as can produce sugar at a cost lower than the world marginal cost survive, and let higher-cost producers go into some other industry offering greater advantages. Before arriving at this conclusion, however, it would be well to find out whether the protective policy with reference to sugar, which has prevailed for over a century, offers no offset to the burden which it imposes.

The most important of the arguments advanced in favor of retaining a duty on sugar may be listed as follows: (1) the vested-rights argument, (2) the young-industries argument, (3) the nationalist argument, (4) the argument that protection affords opportunities for American labor and capital, (5) the argument that protection diversifies industries, (6) the argument that a nation should be self-sufficient in the event of war, (7) the argument that protection to the sugar industry promotes conservation of our natural resources, (8) the argument that protection to domestic sugar producers affords assurance against monopoly, and (9) the argument that a duty on sugar is desirable from a revenue standpoint.

1. The Vested-rights Argument. The very fact that sugar has been granted protection for a long period of time and that during this time the industry has attained a position of no small importance, argues for caution before making any radical change in policy. As shown in Table III (p. 57), the domestic industry in its several regions involves an investment of some $753,000,000 and the em-

ployment of some 279,000 laborers. It is true that the injury which would follow the removal of the duty on sugar may be exaggerated. The cost studies of the Tariff Commission show that a substantial portion of the domestic industry in all regions of production, except perhaps Louisiana and the eastern region of the beet-sugar industry would survive even if sugar were admitted free of duty, though the profits of the surviving establishments would be much reduced. Moreover, a distinction should be drawn between the agricultural and manufacturing stages of the industry. Land is available for other crops; and agricultural labor in the cane plantations and beet fields is not so specialized as to be seriously discommoded in turning to other forms of agricultural employment.

When all is said, however, the abandonment of protection to the sugar industry would result in serious loss to investors and hardship to many laborers. The immediate and concentrated loss and confusion incident to the dislocation of a great industry must be weighed against the long-run, but widely diffused, benefit to the general public to be derived from free sugar. Moreover, the political aspect of the question can not be entirely ignored. the removal of the tariff could be accomplished only by the victory of some political party committed to this policy either with respect to sugar alone or to commodities in general. The loss is immediate and would fall heavily upon a comparatively small number of persons, who, however, because of their

position and standing in their respective communities, have a political influence quite disproportionate to their numbers. The benefits of free sugar (except to the refiners and American investors in Cuban sugar properties) would, on the other hand, accrue slowly and imperceptibly and would be so widely diffused that the beneficiaries would be scarcely conscious of the benefit which they had received. Having in mind the uncertain tenure of political parties, it may be apprehended that before these widely diffused benefits had been attained a political reaction would restore protection—a result to which the loss suffered by the group of persons adversely affected would have in no small measure contributed. Under such circumstances there would have been an economic loss without any compensating economic gain, except to the private interests mentioned above.

Finally, the sugar industry has some claim to consideration under the vested-rights argument not common to protected industries in general. Besides the long period of protection which it has shared with many other industries, it has received direct encouragement of the most strenuous kind from the Department of Agriculture. Indeed, the very existence of a beet-sugar industry may almost be said to be due to the activities in its behalf of this branch of the Government. The wisdom which is displayed by a branch of the Government in thus encouraging an industry which is not likely to become self-sustaining without tariff aid may be questioned. But when such encouragement

has, in fact, been given and a great industry has developed under its stimulus, the wisdom of a sudden and violent change is equally open to question.

But if vested rights argue for caution in removing or greatly reducing the duty on sugar, they equally argue for caution in greatly increasing it. The prosperity of the seaboard refineries, which represent an investment of nearly $200,000,000 and which employ some 20,000 laborers, is largely dependent upon imports of foreign sugar. Any considerable increase in the duty is injurious to this great interest, which, as it more nearly coincides with that of the consuming public than does the interest of the domestic producers, is at least entitled to equal consideration.

In this connection a word may be said for the Cuban sugar industry. It is perhaps out of place to consider the interest of foreign countries in general in connection with the discussion of an American tariff policy. But Cuba stands in special relations to the United States. The reciprocity treaty of 1903, providing for preferential rates of duty, and the supervision which the United States exercises over Cuban affairs put Cuba in a somewhat different position from other countries. They were actions which could easily be interpreted as encouragement on the part of the United States government to the people of Cuba to engage in the production of commodities for export to the United States and to American capitalists to invest in such industries. Under this tacit encouragement the

Cuban sugar industry has rapidly expanded and some three quarters of a billion dollars of American capital has been invested in it. The wisdom of granting governmental encouragement to a foreign industry, even more than the wisdom of granting encouragement to a domestic industry may be open to question, but, the policy once having been adopted, men who have committed their fortunes to enterprises whose success is more or less dependent upon this tacit assumption of governmental approval are as much entitled to consideration before making a radical change in policy as are those who have made investments in a domestic industry under a tacit assurance of protection.

2. The Young-Industries Argument.—It is sometimes claimed by the interests which demand a high duty on sugar that with adequate protection the United States will be able to produce sufficient sugar to supply its domestic needs and that ultimately competition will bring down the price, so that without injury to the consumer we may boast of complete independence of foreigners in the matter of sugar. The argument that the imposition of a duty on certain commodities and under certain conditions may be followed by an ultimate reduction in price to the benefit of the consumer is known as the "young-industries argument" and is generally recognized as sound even by free traders. Its application to the sugar industry hinges on the question whether there is any reasonable expectation that the marginal cost of producing the entire American sugar supply can ever be reduced through

competition and improved methods to a point as low or lower than the foreign marginal cost. It may be said at once that any such expectation is at best remote. The industry has already had over a century of protection, and the domestic marginal cost is still above the Cuban marginal cost, even with less than half of the domestic consumption derived from domestic sources. Sugar is predominantly an agricultural product, and with a long-established agricultural industry it is far more likely that a great increase in output will be accompanied by an increased rather than a decreased marginal cost. (See p. 110.) It would seem inevitable that more than doubling the output from present domestic sources would greatly raise the marginal cost and hence the price.

To consider the several regions specifically: Hawaii has apparently nearly reached its limit and probably the same is true of Porto Rico. Louisiana is even now the highest-cost region of production; its factories are equipped with modern machinery and production is carried on by modern methods; it has been long in the field and presumably already uses the best sugar lands. There would seem to be little prospect of materially increasing output in this region except at increasing cost. In the Philippine Islands, on the other hand, large areas of sugar lands are not yet appropriated to the sugar industry. Antiquated processes and machinery are giving way to improved methods. It is probable that the output could be greatly increased, perhaps doubled, at little or no increase

in marginal cost. Within the continental United States, as was shown by comprehensive surveys made by Dr. Harvey W. Wiley when chief of the Bureau of Chemistry of the United States Department of Agriculture, there appear to be sufficient areas suitable for the cultivation of the sugar beet to furnish sugar in quantities exceeding the entire domestic consumption, but there is no reason for supposing that the lands not yet appropriated to this end are more favorable for the cultivation of the sugar beet than those already utilized. Hence, there would seem to be little promise of securing the added supply at a lower marginal cost—rather the reverse. And it would still remain to be proved that the appropriation of this land to the cultivation of the sugar beet would be better national economy than its appropriation to other crops. An unknown factor in the situation is Florida. This region is just being opened to the cultivation of sugar cane. Promoters claim for it conditions of soil and climate greatly superior to Louisiana and little if any inferior to Cuba. These claims are given countenance by the fact that large and responsible companies have secured sugar lands, are erecting factories, and are beginning to exploit the region. A substantial increase in domestic output from Florida without any increase in marginal cost seems to be possible. It is extremely doubtful, however, whether an output from this source equal to Cuban imports could ever be obtained except at greatly increased marginal cost,

and it is certain that such a result could not be obtained until after the lapse of many years.

3. The Nationalist Argument.—There exists a widespread feeling that it is better to produce things ourselves than to import them; that whenever we can develop an industry to a point where we are "independent of foreigners" we have cause for self-congratulation, even though this independence involve some burden upon consumers. The logical goal from this point of view is complete national self-sufficiency.

So far as sugar is concerned, doubtless, by imposing a sufficiently high duty, this end could in time be attained. As shown above, however, it would probably be at the expense of a heavy burden upon consumers and would, of course, deprive the Treasury of all the revenue now derived from sugar. Still, it could be attained; and the question arises, what would be the benefit? Probably the feeling has its basis in national pride and in an inborn aversion if not hostility to foreigners and to anything foreign. So far as it is susceptible of rational defense, however, it is supported by several plausible arguments, some of which are of a general character and apply to other commodities as well as to sugar; while others apply specifically to sugar. In the background of most of the arguments cited below is this spirit of nationalism as opposed to the spirit of internationalism. Indeed, the "nationalist argument" is not so much an argument as a feeling. It is something accepted by the generality of men

as a matter of course. It is inherent, like patriotism and race prejudice. While not susceptible of logical analysis, probably more than all the other arguments combined it constitutes the great bulwark of protection.

4. The Argument that Protection Affords Opportunities for American Labor and Capital.—Industries established by protection are said to afford opportunities for the employment of American labor and the investment of American capital. This is undoubtedly true, but the implication that the labor and capital in these industries could not, without them, have found an opening is, in general, not true. The normal result of protection is not so much to add to the sum total of openings for American labor and capital as it is to divert them from more to less effective channels. For example, it was shown (p. 120) that a decrease in the rate of duty on sugar would tend to lower the marginal cost of production by driving out those producers whose costs were near the margin. So far as their investment was in the form of specialized plant and machinery this would be a total loss. But to say that the quantity of labor and capital which had been used in these establishments would not find opportunity for as profitable employment elsewhere is entirely without warrant. Looked at in a large way, in any economic group, laborers, organized by capitalists, are occupied in supplying their own wants and those of the capitalists who employ them. They may isolate themselves and produce directly all the things needed by their own

group, or they may obtain part of the things by direct production and the remainder through commerce. If they choose the latter method a part of the labor which under the former method was devoted to supplying articles for themselves will be devoted to producing articles to be exchanged for the articles imported. Of course, the interchange is not accomplished by direct barter but through the medium of money and bills of exchange. But no principle of economic theory is better established by statistics than the principle that a country pays for its imports with its exports. Unemployment and idle capital spring from maladjustment in the complex industrial process and are as likely to occur under a protective as under a free-trade régime. Undoubtedly, a sudden transition from one régime to the other is likely to cause such maladjustment and result in much idle capital and labor. But under normal conditions, once the country has adapted itself to either policy, unemployment and idle capital are no more to be apprehended under one than the other.

The proviso "under normal conditions," however, covers an argument which may be fairly advanced for protection. A country which has adopted a free-trade policy and has adapted its economic life to a large foreign trade runs the hazard of being thrown seriously out of adjustment and of suffering for a considerable time from unemployment and idle capital when abnormal conditions, such as war or other international complications, arise. It is possible that England is now in this situation.

A country more self-contained in its industrial life is relatively less subject to this danger.

5. The Argument that Protection Diversifies Industries.—It is argued that when a country devotes its capital and labor to the production of only those commodities to which it is best fitted it is apt to become stagnant and unprogressive. Especially is this said to be true if the specialized industries are agricultural. The stimulus to the mental life of the people, it is said, is well worth the cost of a moderately protective tariff. It is certainly true that the drift of modern life is to the cities and to manufacturing rather than to agricultural occupations, and it is the great industrial nations rather than the more purely agricultural ones which are dominant in world affairs. For some industries the argument deserves serious attention. So far as the sugar industry is concerned, however, its application would seem to be rather to such regions as Cuba and the Hawaiian Islands than to the continental United States. Both of these countries are probably to too great an extent "one-crop" countries for their own good. It may be plausibly argued that a high protective tariff erected by other nations against Cuban sugar would, for Cuba, prove a blessing in disguise. Deprived of much of her market for sugar, she would be compelled to direct her productive forces to other channels. Her industries would become more diversified and the mental life of her people would be quickened. As applied to the sugar industry in the continental United States the argument has little force.

6. The Argument that a Nation Should be Self-sufficient in the Event of War.—It is urged that industries which produce the necessities of life and also "key" industries are peculiarly deserving of protection. In the event of war, even though the United States is not directly involved, its foreign trade is likely to be seriously affected. Under such conditions, were the United States dependent upon foreign countries for its necessities of life, its people might be subjected to incalculable hardship. Dependence upon foreign countries in the case of certain "key" industries might prove even more embarrassing. Sugar may fairly be claimed as a necessity though its production is hardly a key industry. It would seem to be highly desirable, if it can be done without too great a burden, to obtain a considerable portion of the sugar consumed in the United States from domestic producers. The close proximity of Cuba and the peculiar relation in which that country stands to the United States, however, make the likelihood remote that the United States would ever be seriously embarrassed by lack of sugar, even in the event of war.

7. The Argument that Protection to the Sugar Industry Promotes Conservation of Our Natural Resources.—Aside from the general claims that may be made for protection by all important American industries, sugar presents some claims of a special nature. The most important of these springs from the fact that the cultivation of the beet has a beneficial effect upon the soil and greatly increases the yield of other crops when used in proper rotation.

It may be argued that for this very reason there is little need for protection. If the planting of a beet crop at regular intervals adds as much as is alleged to the output of other crops with which it is planted in rotation, then the profit from the other crops would lead farmers to plant beets even though they had to sell them at a price which would enable sugar factories to compete with foreign sugar imported without duty. The farmers, however, would have to be educated to this point, and perhaps the best means of educating them is through protection. Viewed from this standpoint the case presents something of the aspect of the "young-industries argument," and the duty should be looked on as temporary. Even if permanent, it may at least be said that, if protection is to be granted to agricultural products at all, it is better to make the grant in behalf of crops which are beneficial to the soil rather than of crops which are injurious.

In this connection, though the argument may be somewhat fine spun, it is to be noted that sugar itself is a pure carbohydrate. It is elaborated by sunlight in the leaves of the plant from moisture and from the carbon dioxide in the air. It, therefore, removes no valuable mineral constituent from the soil. The mineral constituents which are absorbed in the cane and beet may, with proper care, be restored to the soil after the sugar has been extracted. It is, therefore, a desirable crop from the standpoint of conservation. From this point of view it has been argued that it is better to grow our own sugar than to import it. For if we grow

it we are conserving our natural resources, but if we import it, the added imports will have to be paid for by increased exports, and there are few great articles of export which do not deplete our natural resources to a greater extent than does sugar.

8. The Argument that Protection to Domestic Sugar Producers Affords Assurance against Monopoly.—An argument which is used with some success in reconciling the public to protection to the domestic industry is that it is necessary as a safeguard against monopoly. It is alleged that if certain great interests, made up of the refiners and the American investors in Cuban sugar properties, were successful in their efforts to reduce or to remove the duty on sugar, they would be in a position first to destroy the domestic industry and then to restrict production and raise prices to the injury of the consumer. Whereas, because of the wide dispersion of the domestic industry among a multitude of small producers, such monopolistic activities on their part are impossible.

Without doubt the refiners and the American investors in Cuba have a community of interest with respect to the tariff. They control great resources, their offices are in close juxtaposition in the business section of New York, they form a compact body of men who can act in concert whenever it may be for their interest to do so. Their interest does call for a reduction of the sugar duty, and there is every reason to believe that they would be glad to free themselves from the competition of domestic producers and control the supply and price in precisely

the manner just described. There is some evidence also that over short periods of time they have been able to manipulate the speculative market to their advantage. All of this may be conceded, but it may still be doubted whether, except over short periods of time, they would have it in their power, even with a very low duty or no duty, to bring about results so prejudicial to the interests of the general consuming public as is the present high rate of duty.

In the first place, the data collected by the Tariff Commission show that, after making allowance for transportation costs to a common market, a substantial portion of the sugar in all the regions of domestic production, except perhaps Louisiana and the eastern area of beet-sugar production, is produced at a cost lower than the present Cuban marginal cost, not including the duty. (See pp. 132–36.) Hence a reduction in the duty would not destroy the domestic industry. A considerable domestic output would be forthcoming even under free sugar.

In the second place, the power of these interests to achieve a monopoly control over supply and price may be doubted. Such a combination on the part of purely American interests would necessarily be clandestine and would be subject to constant attack by the courts. Moreover, even if there were no legal impediment it is doubtful if the attempt to maintain such a combination could be permanently successful. The American Sugar Refining Company, sometimes still referred to as the "Sugar Trust," now furnishes only between 30 and 40 per

cent of the output of refined sugar. It is by no means in a sufficiently dominating position to control the price. Competition would be sure to arise among the independent refiners. Even when the sugar monopoly was most complete it was not able to crush competition altogether. On two occasions it was subjected to competition so active as to leave it little or no profit, first, from Claus Spreckels, and later from the Arbuckles. As to the American investors in Cuba, though they form a compact group controlling about two-thirds of the sugar output of Cuba, they are hardly at present in a position to effect a permanent monopoly capable of limiting the supply and fixing the price. Of the 197 centrals manufacturing sugar in Cuba, more than a third are entirely independent of American control. Even those under American ownership are controlled by different "groups," as the Rionda group, the Howell-Post group, the Atkins group, and others. Experience has shown the difficulty of maintaining a permanent monopoly control among such an aggregate of groups, among whom conflicting interests are sure to arise.

Finally, there is a definite limit to the amount of monopoly profit which could be obtained by a combination either of refiners or Cuban producers. The limit for the Cuban producers is the Cuban preference in the United States tariff. If they hold the price at a figure above the marginal cost (which would be the normal competitive price) by an amount greater than the Cuban preference, American buyers will import full-duty sugars. Under the act

now in force the Cuban rate on 96° centrifugals is 1.7648 cents per pound, and the full-duty rate is 2.206 cents per pound. The difference, 0.4412 of a cent per pound, is the limit above the normal competitive price at which a Cuban combination could hold the price of raw sugar before full-duty sugar would begin to come in.[1] As the duty is reduced, so also is the Cuban preference and the possibility of profit by a Cuban combination. If the duty were entirely removed, the Cuban preference would disappear and with it the possibility of monopoly profit by a combination. However, it takes time to establish new connections, to make purchases, and to transport sugar from new regions. It is not

[1] The argument in the text is based on the supposition of a "world market" for sugar from whatever source derived. World-wide competition would tend to establish such a market and fix a world price from which the prices quoted in any specific market may differ only by transportation and tariff charges. Cuban sugar, South American sugar, Java sugar would all conform to this price. Suppose this price c. and f. New York were 5 cents per pound. Then the duty-paid price on Cuban sugar would be 6.7648 cents per pound. Now, because of the Cuban preference, the duty-paid price from other foreign countries would, under the supposition of a world price, be 7.206 cents per pound. Hence, so far as the New York market is concerned, a Cuban combination could hold the price at 5.4412 instead of 5 cents before it encountered competition from other foreign sources and hence could reap a monopoly profit of 0.4412 of a cent per pound.

The New York price determines the price in other markets in the United States. (See p. 115.) In somewhat the same way one market is the dominant market of the world. Formerly it was the Hamburg market which fixed the world price. Now New York is the dominant market for the world as well as for the United States, and it is the New York price that fixes the world price. But it is conditions of world supply and world demand that in turn fix the New York price.

denied that, were a combination of Cuban producers possible, it might make a monopoly profit above the Cuban preference for a brief time.

Similarly with respect to the refiners, their possibility of permanent monopoly profit is limited by the price at which refined sugar can be imported. Leaving out of account differences in costs of transportation, and assuming that sugar can be refined at the same cost in some foreign country, say, England, as in the United States, then the possibility of permanent monopoly profit by a combination of American refiners is the difference between the full duty on imported refined sugar, 2.39 cents per pound, and the preferential duty on Cuban raws, 1.7648 cents per pound, or 0.6252 of a cent per pound.[1] To this must be added the difference in freight charges between the routes Cuba–London–New York and Cuba–New York. Allowance must also be made for a possible difference in the cost of refining in the United States and England. But

[1] Assume the price of Cuban raws to be 5 cents per pound f.o.b. Cuba, and that they can be imported into England duty-free when imported for refining and reexport:

	New York	London
Price of 96° centrifugals f.o.b. Cuba	5.0000	5.00
Duty on Cuban raws at New York	1.7648	....
Cost of refining, including *normal* profit	1.5000	1.50
Duty on refined sugar from England at New York	.....	2.39
	8.2648	8.89

Under the conditions assumed refined sugar could be imported from London at 8.89 cents per pound. American refiners could produce refined sugar in New York and receive a normal *competitive* profit at 8.2648. Hence there is a possible *monopoly* profit of 0.6252 of a cent per pound.

when all allowance is made, it is seen that the burden upon the consumer which could be exacted by a combination either of refiners or of Cuban producers is much less than the burden of the tariff. As in the case of the Cuban producers, it is the permanent burden which is referred to. Over short periods of time a combination of refiners manipulating the market might produce price fluctuations much in excess of the above figures.

On the other hand, the possibility of combination by the domestic producers must not be neglected. It is true there are a great number of competing producers and that they are scattered over wide areas in the continental United States and its insular possessions. Such a situation, it is argued, is fatal to effective combination. Yet the possibility of concerted action is proved by the sugar tariff itself. The producers in the several regions of domestic production maintain trade associations, one of the duties of which is to represent their interests before Congress. The increase in duty under the acts of 1921 and 1922 is directly traceable to the pressure brought to bear upon Congress by these great interests both by individual representatives and by concerted action through their trade associations.

On the whole, it would seem that whatever danger there may be from price manipulations by the concerted action of the refining and Cuban interests, it would be diminished rather than increased by the removal of the duty on sugar. With the removal of the duty any attempt at artificial price-fixing by such a combination would be quickly met by the

entrance into the American market of sugars from manufacturers and refiners in every quarter of the globe. Such an artificial price could be made effective for a few months at most and the burden on the public could hardly equal the permanent enhancement of price due to the tariff. It may be recalled in this connection that it was a great magnate in the sugar industry who testified before the Industrial Commission in 1899 that "the mother of all trusts is the customs tariff bill."

9. The Argument that a Duty on Sugar Is Desirable from a Revenue Standpoint.—As a source of revenue sugar has been and still is the most important of all imported articles. It yields not far from one-fourth of the entire amount derived from customs duties. Having in mind the needs of the government, there is probably no argument in favor of a duty on sugar more forcible at the present time than its availability for revenue. It is a thoroughly standardized commodity, and under the method of assessing duties in accordance with the polariscopic test it carries little danger of fraud or evasion. Although the duty on sugar imposes no small burden upon consumers as a whole, yet sugar is to such an extent an article of universal consumption that the burden is widely diffused and is not heavy upon any one person. (See pp. 97–100.) Reduced to a per capita basis the total annual burden of the sugar duty was shown to be $1.97. Of this amount $1.13 is the taxpayer's contribution to the United States Treasury and 84 cents is his contribution for protection to the sugar industry.

At just what figure the rate should be fixed, when imposed for the purpose of revenue, is a matter to be decided in the main on grounds of political expediency; but the following economic principles may be kept in mind in arriving at a decision. In any year, under the conditions of supply and demand then prevailing, there is some rate which will yield a maximum revenue. A rate lower than this, though tending to increase imports, will not increase them enough to offset the loss on each pound due to the lower rate; and a rate higher than this maximum, though yielding more revenue per pound, will diminish imports to an extent more than sufficient to offset the gain. Obviously, in fixing a duty for the purpose of obtaining revenue the rate should not be higher than this maximum revenue-yielding point. Below this point the following principle should be kept in mind: As the duty is increased the burden is increased not only on the imported sugar, which burden may be justified by the added receipts to the Treasury, but it is also increased on a steadily increasing proportion of domestic sugar without any compensating benefit to the Treasury.

CHAPTER IX

CONCLUSIONS

Before stating the conclusions arrived at in the present study it should again be emphasized that the large question of the respective merits of free trade and protection as general principles of national economic policy are not entered upon. Nor is judgment passed upon the question whether or not a customs tariff is from a fiscal standpoint a desirable method of raising revenue. It is assumed that a customs tariff is to remain and that the somewhat illogical procedure of using it for both protection and revenue is also to continue. The primary aim of the study is from this viewpoint to determine what should be the tariff policy with respect to sugar.

The principle of "equalizing costs of production" does not offer a fully satisfactory solution. A principle which has gained much popular approval as a satisfactory solution of tariff problems is that of equalizing costs of production. This principle is now embodied in law. Under section 315 of the Act of 1922 the President is authorized to change the rate provided in paragraph 501, in case the rate there provided does not equalize costs of production between the United States and its chief foreign competitor, to such an extent that the new rate will equalize such costs of production. The Tariff

Commission is entrusted with the task of securing the necessary cost data. (See Appendix H, p. 242.)

Judging by previous experience there will be little difficulty in obtaining adequate data from all of the domestic regions of production; and the economic and political situation is such that there is little doubt that adequate data will also be secured from Cuba, the only foreign competitor that needs to be considered. The case is, therefore, one of great interest as a test in the application of the law.

The previous experience of the commission indicates that in Cuba and in all regions of domestic production there will be found about as many different costs of production as there are factories, and the question will arise which, out of this multitude of foreign and domestic costs, shall be selected as *the* foreign cost and *the* domestic cost to be compared in order to ascertain the equalizing rate of duty.

The costs which would seem from the discussion in Chapter V (p. 123) to have the best claim to be used for this purpose are the marginal costs and the average costs. After making proper allowance for freight differentials, the marginal costs f.o.b. factory in all regions of domestic production should be approximately the same; and if this marginal cost and the Cuban marginal cost f.o.b. factory plus transportation charges to the competitive market can be ascertained the difference between them may be declared the "equalizing rate" of duty. If the industry had been in a settled condition for a number of years this rate at least would have the

merit of maintaining the foreign and domestic industries in about the same relative position in the American market as they had been in the past, and if this be the object aimed at in "equalizing costs of production," then the rate so ascertained might without impropriety be denominated the "equalizing rate."

But in a literal sense there is no single equalizing rate. *Any rate of duty, short of a prohibitory rate, will equalize the cost of production between some Cuban producer and some domestic producer, and after the lapse of years production in Cuba and in the various domestic regions will adapt itself to this rate, the margins will be raised or lowered, and this rate also will be found just to equalize the difference between marginal costs and hence with equal propriety might be denominated the "equalizing rate."*

If conditions in the sugar industry had remained normal since the passage of the Act of 1913 it might be asserted with some confidence that the "equalizing rate" ascertained as above would be found to be not far from 1 cent per pound, the rates of 1.6 under the Emergency Act and of 1.7648 under the Act of 1922 not having been in force long enough to have greatly affected the previous marginal costs in Cuba and the United States. Under such conditions the present rate of 1.7648 cents per pound would be pronounced too high and should be reduced to the "equalizing rate" of 1 cent per pound.

But conditions in the sugar industry have been very far from normal since 1913, and there have

been also very great changes in general price levels and wage levels. It is highly probable that the Tariff Commission will find the difference between marginal costs above 1 cent per pound, perhaps even as high as the present rate of 1.7648 per pound. If such is the case, then the President will have no ground for changing the rate; and the longer it remains unchanged the more will conditions in Cuba and the United States tend to adapt themselves to it, and subsequent investigations by the Tariff Commission will show it to be the "equalizing rate."

The Tariff Commission, instead of using marginal costs, which are somewhat difficult to determine, may prefer to use average costs and may make the equalizing rate the difference between the Cuban and domestic average costs. In this event also relative costs of production will tend to adapt themselves to the rate which is finally adopted, whatever it is. If the rate is made high, higher-cost domestic producers will be able to compete, thus tending to raise the domestic average cost, and some of the highest-cost Cuban producers will be unable to compete and will be eliminated, thus tending to lower the Cuban average cost. But the adjustment is not so complete as in the case of marginal costs. The increase or decrease in average costs will never be so great as the increase or decrease in duty; hence, the difference in average costs may remain permanently greater or less than the duty. For this reason if, as a result of the present investigation the President should apply what the Tariff Commission finds by the methods

of averages to be the equalizing rate, then another investigation, undertaken a few years later, would find some other rate to be the "equalizing rate."

The use of average costs presents a problem which does not arise in connection with marginal costs. The forces of competition tend to make marginal costs the same in all regions of domestic production but do not necessarily so affect average costs. Hence the question will arise whether the Cuban average should be compared with the domestic average taken as a whole or region by region. The difference between the Cuban and Louisiana averages might be greater than the difference between the Cuban and Hawaiian averages and hence would indicate a higher rate of duty. A rate, determined by averages, sufficient to protect the beet-sugar industry in the mountain States would be insufficient for Michigan. Hence, the use of averages in determining the rate will call for the exercise of judgment, whether it is the intent of Congress in making the provision to protect the domestic industry as a whole or to protect it in its highest-cost region of production.

Before dismissing the subject of average costs it should be noted that both the domestic and Cuban average costs are much lower than their respective marginal costs, but that the difference between the Cuban and domestic average costs is not necessarily very different from the difference between the Cuban and domestic marginal costs. Hence the rates of duty determined by these two methods may not differ widely.

The rate of duty on sugar should be determined on broad grounds of public welfare—not by set formula. By the methods described in the last few paragraphs it is evident that the Tariff Commission may determine a rate of duty upon sugar which may be denominated the rate which equalizes costs of production, and it may be that the rate so determined will prove as satisfactory to the various interests concerned as would a rate determined by any other method. It will have an appearance of mathematical precision, which will give it an air of finality and will serve to silence criticism. But since, as has been shown, any rate which the commission might name within a considerable range could, after the lapse of a few years, equally claim the merit of being the rate which would equalize costs of production the method can hardly be called scientific.

The fact is that the question is at heart not one calling for a solution by a set formula such as that of "equalizing costs" or of "equalizing competitive conditions." It is a question of public welfare. A low duty will produce certain results beneficial to some interests and injurious to others. A high duty likewise will produce certain results beneficial to some interests and injurious to others. The economist may state what these results are and express an expert opinion as to their relative merits from an economic standpoint. His statement and expression of expert opinion should be valuable aids to Congress in forming a judgment. Some of the most important factors, however, are noneconomic in character.

Some are sentimental, as the nationalist spirit, which regards the production of the articles we consume by Americans rather than foreigners as a good in itself independent of economic benefit. Some are political, as the bearing of tariff legislation upon the question of international good or ill will. Some are ethical, as the question of vested rights. And even where the factors are economic, there must be a weighing of economic benefits and injuries.

For example, what principle will determine the exact rate yielding the greatest economic benefit where the conflicting interests of domestic producers, seaboard refiners, American domestic consumers, investors in Cuban sugar properties, and the Government itself in its needs for revenue are to be compared and weighed? Such questions are obviously not matters to be settled by rule-of-thumb. Moreover, they affect vitally the personal and property rights of citizens. It is doubtful whether Americans will ever consent to entrust them to any body not directly responsible to the people. In matters of public policy, even where the economic and other considerations are all clearly understood, men are bound to differ in opinion as to what results are desirable and to group themselves in political parties in order to put their convictions into effect. In short, the tariff is in its very nature a political question and is likely to remain so. The hope of "taking the tariff out of politics" is visionary.

SUMMARY OF CONCLUSIONS

In the course of this investigation the following conclusions bearing upon the tariff problem as it relates to sugar have been reached.

1. The domestic sugar supply is produced at many different costs—from a cost so low that the domestic establishments producing at that cost can easily meet foreign competition from any source to a cost so high that even the present rate of duty is inadequate to afford protection.

2. Among the numerous costs in each region of production there is found to be one which is so high that the establishment incurring it is barely able to survive from year to year. This cost may be called the "marginal cost," and the establishment incurring it may be called the "marginal producer." A few establishments are always found to be producing at a higher cost than this; that is, they are producing at a loss and hence are in process of elimination. The great bulk of the establishments produce at a cost less than the marginal cost and hence make greater profits in proportion as their costs are lower.

3. The marginal costs in all regions of domestic production contributing to the same market, tend, after allowing for transportation costs, to become equal to each other and equal to the market price. The marginal costs in all regions of foreign production contributing to that market, again allowing for transportation costs, tend to differ from the domestic marginal cost by the amount of the duty

to which the foreign sugars are subjected before they can enter that market.

4. Marginal costs tend to adapt themselves to changes in the tariff. An increase in the rate sets in operation economic forces which tend to stimulate domestic production and decrease importation and ultimately to raise the domestic and lower the foreign marginal cost.

5. From all this it follows that any rate of duty is a protective rate in the sense that it permits a portion of the domestic industry to survive foreign competition, and that the tariff problem is not a question of maintaining or destroying the domestic industry as a whole, but of determining what proportion of the total domestic consumption shall be of domestic origin and what proportion shall be derived from importation. Viewed from another angle, the problem is that of determining how great a degree of ineffectiveness in production and how great a burden upon consumers may be properly offset by increased national self-sufficiency.

6. It further follows that after a lapse of years sufficient to allow costs of production to adapt themselves to a change in rate, any rate of duty will equalize costs of production, if by "costs of production" is meant "marginal costs of production." Hence, the problem now before the President of adjusting the duty so as to equalize costs of production is indeterminate.

7. The annual burden upon consumers brought about by the duty on sugar may be roughly estimated at $216,500,000, or about $1.97 per capita.

Of this amount $124,500,000, or $1.13 per capita, is revenue received by the United States Treasury, and $92,000,000, or $.84 per capita, is the taxpayer's contribution to "protection." With every increase in duty the revenue tends also to increase up to the point where the diminishing imports offset the increased receipts per pound; but the proportion of the taxpayer's burden which goes to revenue tends to decrease while the proportion which goes to "protection" tends to increase.

8. A careful weighing of all the arguments and of all the results developed by the inquiry leads to the conclusion that from the standpoint both of revenue and protection sugar is a suitable commodity to be subject to a moderate rate of duty. A rate which will maintain roughly the present proportions of domestic and foreign sugars in the domestic market is recommended. From the best data now available a rate of not less than 1.25 nor more than 1.5 cents per pound on 96° Cuban centrifugals is suggested as adequate to accomplish that purpose.

The grounds for the first seven of the above conclusions have been sufficiently discussed in preceding chapters. The eighth calls for more extended discussion.

It was stated that the rate should be based on broad principles of public welfare. But the public is made up of diverse elements having antagonistic interests. In the case of sugar the interests chiefly to be considered are: the Government with reference to its need of revenue, the masses of the people as taxpayers and consumers of sugar, the domestic producers,

the refiners, and the American investors in Cuban sugar properties.

It is for the interest of the masses of the people that sugar should be admitted free of duty or, if subject to duty, that the rate should be low. The Government, however, needs revenue and because of the enormous public debt the need at the present time is pressing. To obtain revenue the people must be taxed. If it be assumed that the tariff is to serve in the future as in the past the double purpose of protection and revenue, sugar admirably adapts itself to this double purpose. Its revenue-yielding capacity is very great; for many years about one-fourth of the entire customs receipts have been derived from sugar; while the burden which the sugar duty in its protective capacity imposes upon the people, though great in the aggregate, is widely diffused and comparatively light upon any individual consumer.

For the refiners and American investors in Cuban sugar properties, as for the masses of the people, the lower the rate the better. The sugar duty, however, is no new thing; the business of the refiners and investors has developed to its present proportions in the face of it and, therefore, so long as it remains moderate it is not a serious burden.

The domestic producers are benefited by a high duty and exert a steady pressure upon Congress to increase the rate. They represent a combined investment about equal to the combined investment of the refiners and the American investors in Cuban sugar properties.

The interests just discussed are all important and should all be given consideration and their claims weighed, when the attempt is made to fix the sugar duty on broad grounds of public welfare. Such a dispassionate study and weighing of claims leads to the conclusion that a wise national policy calls for the retention of a duty on sugar. So long as a customs tariff, whether levied for the purpose of protection or revenue, continues to be a part of our fiscal system there are cogent reasons why sugar should remain on the dutiable list. These reasons, briefly summarized, are (1) the availability of a sugar duty for revenue because of its great productiveness and the wide diffusion of the burden. (2) The political and economic inexpediency of suddenly reversing a long-established policy of government. The sugar industry has received not only protection but special encouragement from the Government. Under this encouragement a great industry has developed which is to a considerable extent dependent for its prosperity upon a continuance of protection. It would seem unwise, by a reversal of policy, to bring disaster to this industry. At any rate, so long as the principle of protection remains embodied in the tariff, there are no adequate reasons why the sugar industry should be singled out for attack. (3) It is a desirable industry to maintain because of its beneficial effect upon the soil, improving it for other crops and depleting it of no valuable mineral constituents. (4) Though less cogent than the other reasons, there may be some wisdom in maintaining a strong domestic

sugar industry in the interest of national self-sufficiency.

But if there are cogent reasons for maintaining a duty on sugar, there are equally cogent reasons against an excessive duty. With every advance in the rate, the burden upon consumers tends to increase without a proportionate increase in the revenue, less effective domestic producers are brought into the field and, once established, may claim the "vested-rights" argument for their maintenance, and, finally, reasons similar to those which were advanced in behalf of the domestic producers against the reversal of a long-established policy may be advanced in behalf of the seaboard refineries and the Cuban interests.

Admitting that sugar should be retained on the dutiable list and that the rate should not be excessive, there may still be considerable difference of opinion as to the point at which the rate begins to be excessive. The difficulty of applying any such principle as that of "equalizing costs" or "equalizing competitive conditions" has been fully explained (p. 122). But in the course of the explanation a principle was brought out which might be made a basis of tariff adjustment in the sugar industry. (See p. 121.) *Through the tariff it is possible to regulate the proportions of the total domestic consumption which should be derived from domestic and foreign sources.* Mathematical precision is, of course, not to be looked for; the proportion realized will only approximate the proportion desired—and even then only after the lapse of years. With this understanding, however, it would be possible so to adjust

the rates that in the long run about one-third, or about one-half, or about two-thirds of the quantity consumed should be of domestic production.

In recent years a little less than one-half of the domestic consumption has been of domestic production.[1] This situation may be regarded as by no means unsatisfactory. It was brought about by the rates of 1.685 cents per pound of the Act of 1897, later reduced to 1.348 cents per pound by the reciprocity treaty with Cuba; continued at the same rate (1.348 cents per pound) under the Act of 1909; and again reduced to 1.0048 cents per pound by the Act of 1913. The acts of 1921 and 1922 have not yet had time greatly to affect the marginal costs of production either in the United States or Cuba.

In making a recommendation, the Institute is guided by the principle just outlined. A weighing of the conflicting interests (the government in its need for revenue, the masses of the people as taxpayers and consumers, the domestic producers, the refiners, and the American investors in Cuban sugar properties) has led to the conclusion that the most equitable adjustment will be effected by a rate which will stabilize the industry in about its present position with reference to foreign and domestic sugars.

As for some years after the passage of the Act of 1913 the proportion of domestic sugars in the total domestic consumption continued to increase, it

[1] This percentage was 47.8 in 1919, 34.2 in 1920, 53.9 in 1921, 42.5 in 1922, 42.0 in 1923.

would appear that the rate of 1.0048 cents per pound imposed by that act was more than sufficient for the purpose of such stabilizing. There are reasons for believing that a rate of somewhat more than 1 cent per pound would now be necessary for that purpose.

The value of money has declined since 1913. A cent does not have the same purchasing power and, when applied as a specific duty, does not afford the same protection now as then. Tariff Commission figures indicate that in 1913 the Cuban marginal cost of sugar (including transportation to New York) was about 2.8 cents per pound, while the domestic marginal cost was about 3.8 cents per pound. Index numbers of wholesale prices are at present fluctuating about a figure not far from 150, on a basis of 100 for 1913. If costs of production have increased all along the line in the ratio of index numbers, then on the basis of an index number of 150 the marginal cost in Cuba would now be 4.2 cents per pound and the marginal cost in the several regions of domestic production would be 5.7 per pound, the difference being 1.5 cents per pound. That is, on the basis of the present purchasing power of money, conditions which would have justified a rate of 1 cent per pound in 1913 would now justify a rate of 1.5 cents per pound. On this basis, if a rate of 1 cent per pound was a little more than sufficient to stabilize the industry in 1913, a rate of a little less than 1.5 would be sufficient to stabilize the industry now.

But an index number is an uncertain guide. It is an average; and an individual industry may follow

a course with respect to costs and prices differing considerably from the average. In the present instance, however, the use of index numbers as a method of estimating costs appears to be warranted. The present Cuban marginal cost c. and f. New York, obtained by the use of index numbers, is, as just noted, 4.2 cents per pound. The marginal cost indicated by the recent report of the Tariff Commission (average, 1921–22) is 4.18 cents per pound.

Recent Tariff Commission figures support this conclusion. In Chapter V (pp. 137–149) an analysis of the recent report of the Tariff Commission was attempted and several rates were obtained which, according to the basis assumed, should approximately "equalize costs of production" as they are at the present time and hence tend to stabilize the industry in its present ratio of foreign to domestic consumption. These results ranged between the extremes of 1.22 and 1.66 cents per pound. On the whole, the result obtained from a weighted average of marginal-cost differentials would seem to have the weight of evidence in its favor from the standpoint of theory. This rate was 1.37 cents per pound. It will be noted that it does not differ greatly from the rate obtained by the method of index numbers ("a little less than 1.5 cents") nor from the rate obtained by averaging the differentials obtained by the Tariff Commission for previous years (1.25 cents). Without wishing to appear dogmatic, it would seem that a rate somewhere between these limits (1.25–1.5 cents per pound against Cuban sugar) would be ample to stabilize the sugar industry with respect

to the proportions of foreign and domestic output in the total consumption.

The present rate (1.7648) appears to be unnecessarily high. It will tend to raise the domestic marginal cost and encourage the entrance into the field of ineffective domestic producers who, once they have become established can claim the "vested-rights" argument against a reduction of the duty. If a reduction is to be made the present is a favorable time for making it. The high range of prices—much above marginal costs (see p. 134) —makes it possible to effect a substantial reduction in the rate, resulting in some relief to consumers without imperiling any branch of the domestic industry.

APPENDICES

APPENDIX A

CONTRACT FORMS BETWEEN BEET-SUGAR MANUFACTURERS AND FARMERS

MICHIGAN SUGAR COMPANY

SAGINAW PLANT

Sugar Beet Contract concerning raising and delivery of sugar beets for campaign of 1923.

The undersigned hereby agree to plant, cultivate, harvest, and deliver during the year commencing with the spring of 1923, to the Michigan Sugar Co. (Saginaw plant), for its factory in Carrollton, Mich.....acres of sugar beets on the following described lands, to wit:.....in section.....township of .....in the County of.....State of Michigan.

At least 15 pounds of seed per acre shall be planted, which seed shall be furnished by the Michigan Sugar Company, at 15 cents per pound, and the cost of same is to be deducted from the first payment made for beets delivered. The title to said seed and to said crop of beets from the time when the same begins to grow shall be and remain in the company.

The beets are to be given due care, and the grower will follow instructions of the company in regard to preparing the soil, seeding, caring for, harvesting, and delivering the crop.

In case the grower does not give the said beets due care or does not follow the instructions from the company regarding the caring for or the harvesting of the crop, then the company shall have the right to enter upon the lands set forth, and to care for, cultivate, harvest, and retain the crop and charge the expense thereof to the grower.

All beets delivered under this contract shall be as free from dirt as possible and without weeds and leaves, and shall be properly

topped by the grower by passing the knife under the lowest leaf mark at right angles to the longitudinal axis of the beet.

Said beets shall be harvested and loaded by the grower for the company on cars, or delivered at factory sheds, at such time and in such quantities as may be directed by the company. The company will not be liable to receive or pay for beets which do not test 12 per cent sugar, are rotten, or deemed by them otherwise unfit or undesirable for making sugar.

It is understood and agreed that all beets delivered from wagons or trucks shall be unloaded as directed by the company, and, if forked into piles, all beets scattered on the ground by the grower shall be picked up by him and thrown on a pile before wagon or truck is moved.

Beets delivered under this contract and loaded on cars by the grower will be paid for, subject to tare for dirt and improper topping, in accordance with the following table:

If the average price of beet sugar, as hereinafter determined, is:	The total compensation for beets will be:
$6.00 per 100 pounds	$7.00 per ton beets
$7.00 per 100 pounds	8.00 per ton beets

If the average price of beet sugar, as hereinafter determined, is:	The total compensation for beets will be:
$8.00 per 100 pounds	$9.00 per ton beets
9.00 per 100 pounds	10.00 per ton beets

Fractional advances in the average price of beet sugar above $6 per 100 pounds will be paid for in the same proportion as set out in the above table.

If, however, the average price of beet sugar as hereinafter determined is less than $6 per 100 pounds, then the company will pay $7 per ton for beets grown and delivered under this contract.

Preliminary payments to the grower will be made at the rate of $7 per ton for beets grown and delivered under this contract, and will be made on the fifteenth of each month for beets delivered the preceding calendar month.

If the average price of beet sugar as hereinafter determined exceeds $6 per 100 pounds, then an additional price per ton above $7 will be paid by the company on February 15, 1924, so that the total price paid per ton for beets grown and delivered under this contract shall be as above set forth.

For beets delivered and unloaded by the grower in beet bins at the factory an additional seventy-five (75) cents per ton will be paid.

Said average price of beet sugar shall be determined from the official New York net cash market quotations of Willett & Gray covering the central States territory (Michigan, Ohio, Indiana, and Illinois) during the months of October, November, and December, 1923, and January, 1924, by adding together the prices of beet sugar so quoted for the working days of the said period and dividing the total by number of days quoted.

All wagons or trucks used by the grower in the hauling and delivering of said beets shall have boxes with tight bottoms, also tight sides and ends for 4 inches above bottoms, and shall be free from holes and cracks of sufficient size for dirt to sift through. Beets must be forked from wagon or truck by grower with a regular beet fork, and all dirt remaining in wagon or truck must be weighed out with wagon or truck.

All samples for tare must be forked into tare baskets in the regular manner and must be fair samples of load.

This contract not valid until approved by an officer of the company or its plant manager, and no agent of the company has any authority to change or alter the terms and conditions of this contract.

(Signature of GROWER).....

MICHIGAN SUGAR COMPANY (SAGINAW PLANT)

Per.....

PLANT MANAGER

Date.....1923

THE GREAT WESTERN SUGAR COMPANY

LONGMONT FACTORY

MEMORANDUM OF AGREEMENT between .....grower, and THE GREAT WESTERN SUGAR CO., Executed the .....day of.....1923. The parties hereto mutually agree as follows, to wit:

1. The grower agrees to prepare the land for, plant, block, thin, cultivate, irrigate, harvest, and deliver during the season 1923, in compliance with the directions of the Great Western Sugar Co., hereinafter called the company, as may be given from time to time .....acres of sugar beets on the following described lands, to wit:.....quarter, section.....township.....range.....County, Colorado; but in no event shall the company be held liable in damages for any failure or partial failure of crop or any injury or damage to beets.

2. That the seed shall be only that furnished by the company, for which the grower shall pay fifteen (15) cents per pound, and not less than 12 pounds per acre shall be planted. Seed bed must be approved by the duly authorized agents or fieldmen of the company before the seed is planted.

3. The grower agrees that all beets grown by him will be harvested and delivered to the company as directed, at the factory or in cars at designated receiving stations of the company, properly topped at base of bottom leaf. The grower further agrees that all beets grown and delivered by him shall be free from dirt, stones, trash, and foreign substance liable to interfere with the work at the factory and shall be subject to proper deductions for tare, and that he will protect the beets from sun or frost after removal from the ground. The company has the option of rejecting any diseased, frozen, or damaged beets, beets of less than twelve per cent (12 per cent) sugar or less than eighty per cent (80 per cent) purity, or beets that are not suitable for the manufacture of sugar. It being agreed and understood that the company shall not be obliged to receive any beets prior to October 8 containing less than fifteen per cent (15 per cent) sugar.

4. In the event that any portion of the beets grown under this contract shall not by the eighth day of October of said year be ordered delivered by the company, then in such case it shall be the duty of the grower to commence promptly and proceed with the harvesting and delivery of such beets as come within the contract requirements after the said eighth day of October without further notice from the company, and to complete full delivery of all of said beets on or before the first day of December of said year.

5. All beets grown under this contract and delivered to factories, or designated "receiving stations," in good condition in accordance with the terms of this contract, will be paid for by the company on the following basis:

The price per ton (2,000 pounds) of beets delivered hereunder to the company shall be determined upon the average net return per 100 pounds of sugar received by the company from sugar manufactured at all factories of the company within the States of Colorado and Nebraska, from the 1923 crop, and sold by the company during the period commencing October 1, 1923, and ending September 30, 1924, and also upon the average sugar content of all beets of the 1923 crop sliced by the factories of the company located in the State of Colorado, in accordance with the following schedule:

Average net price received for sugar per bag	Average Per Cent Sugar in Beets Sliced Colorado Factories										
	18.0	17.5	17.0	16.5	16.0	15.5	15.0	14.5	14.0	13.5	13.0
$	$	$	$	$	$	$	$	$	$	$	$
8.00	11.34	11.02	10.71	10.39	10.08	9.77	9.45	9.14	8.82	8.50	8.18
7.00	9.72	9.45	9.18	8.90	8.63	8.37	8.10	7.83	7.56	7.29	7.01
6.75	9.31	9.05	8.79	8.53	8.27	8.02	7.76	7.50	7.24	6.98	6.72
6.50	8.91	8.66	8.41	8.16	7.91	7.67	7.42	7.18	6.93	6.68	6.43
6.25	8.50	8.27	8.03	7.79	7.56	7.32	7.08	6.85	6.61	6.37	6.14
6.00	8.10	7.87	7.65	7.42	7.20	6.97	6.75	6.52	6.30	6.07	5.85
5.75	7.69	7.48	7.27	7.05	6.84	6.62	6.41	6.20	5.98	5.77	5.56
5.50	7.29	7.08	6.88	6.68	6.48	6.27	6.07	5.87	5.67	5.50	5.50
5.25	6.89	6.69	6.50	6.31	6.12	5.92	5.73	5.54	5.50	5.50	5.50
5.00	6.48	6.30	6.12	5.94	5.76	5.58	5.50	5.50	5.50	5.50	5.50
4.75	6.07	5.90	5.74	5.57	5.50	5.50	5.50	5.50	5.50	5.50	5.50
4.50	5.67	5.51	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
4.25	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50

Fractions of sugar prices and beet tests to be in the same relative proportion. If sugar prices or beet tests are higher or lower than shown in the foregoing schedule, the price to be paid for beets shall be increased or decreased proportionately, but the minimum price for beets hereunder shall be the sum of $5.50 per ton.

The net return on sugar sold as aforesaid during said period shall be determined by deducting from the gross sales price all such charges and expenditures as are regularly and customarily deducted from gross sales price of sugar, in accordance with the company's system of accounting heretofore established, showing net receipts from sugar sold, after deducting all excise and sales taxes, if any, imposed on the production or sales of such sugar.

The percentage of sugar beets sliced, upon which is also based the price per ton of beets purchased hereunder, shall be determined by dividing the total number of tons of sugar in all beets from the 1923 crop sliced in all the factories of the company in the State of Colorado, taking said factories together as a unit (as determined by the factory laboratory analysis of cossettes), by the total number of tons of beets from said crop wherever grown which shall be sliced in all factories of the company in Colorado during said campaign (the beet tonnage to be established by the factory scale weights in each of said factories).

Initial payments shall be made on the fifteenth day of each calendar month for beets delivered hereunder during the previous calendar month, at the rate of $5.50 per ton. Further payments will be made on the aforesaid price for beets from time to time in such amounts as the company may deem to be justified by market conditions and the quantity of said sugar sold. Final settlement for all beets delivered hereunder shall be made in accordance with the terms of this contract not later than October 15, 1924. Provided, however, that the company shall be entitled to deduct from initial payments due hereunder, and from any other amounts that may be due on said contract price for beets delivered under this contract, any and all indebtedness whatsoever which may be owing at any time by the grower to the company.

6. The grower shall have the privilege of selecting, at his expense, a man of reliable character, satisfactory to the company, to check the tares and weights of the beets under this contract at the receiving stations where any such beets may be delivered, and to check the polarization and purity of any beets that may be refused because of inferior quality and to check the analysis of beets as sliced.

7. It is further agreed in the event of a shortage of cars after October 8, causing serious delay to the grower, said grower shall be allowed to fork his beets into piles, providing he piles them eight (8) feet high, under the direction of the company at the receiving stations where large elevated dumps are established; and no loose dirt shall be removed from the wagon box until after having been weighed back.

8. To ascertain the quality of said beets, the company shall have the privilege at various times during the growing and harvesting season of causing the beets to be sampled and polarized.

9. The grower agrees not to assign this contract without written consent of the company.

THE GREAT WESTERN SUGAR COMPANY

LONGMONT FACTORY .....

By..... .....GROWER

1923

MEMORANDUM OF AGREEMENT between .....grower, and UNION SUGAR CO., Betteravia, Cal.

The Union Sugar Co., hereinafter called the company, and .....hereinafter called the grower, have agreed as follows:

1. The grower agrees that during the season of 1923 he will grow sugar beets upon about.....acres of land hereinbelow described, and that he will, in compliance with the directions of the company, which may be given from time to time, prepare said land, and plant, replant, thin, cultivate, irrigate, harvest and deliver said crop in good condition at the company's factory at Betteravia, as may be directed by the company; deliveries to be made not more than five days before the opening of the factory for the campaign of 1923 and not later than five days before the close of said campaign.

2. The company will furnish seed, for which the grower will pay fifteen (15) cents per pound, and no seed other than that furnished by the company shall be used in the planting or replanting of said crop.

3. Beets must not be irrigated after July 15, except by written permission or direction of the company.

4. The grower agrees to deliver beets free from stones, trash, or foreign substances liable to interfere with the work in the factory.

5. The company may deduct the weight of earth from the total weight of each lot of beets delivered; and may make proper deductions when beets are insufficiently topped.

6. All sound beets will be bought and paid for as follows: The price per net ton will be based on the average net price, f.o.b., factory, received for sugar sold by the Union Sugar Co. (after deducting any tax on sugar, not now but hereafter imposed by law) during the period of twelve months, begnning July 1, 1923, as ascertained

and certified to by certified public accountant as per the following table:

Net price rec'd for sugar	Percentage Sugar in Beets										
	12	13	14	15	16	17	18	19	20	21	22
Cents											
5	4.66	5.05	5.44	5.83	6.22	6.61	7.00	7.38	7.77	8.16	8.55
5½	5.14	5.56	5.99	6.42	6.85	7.28	7.70	8.13	8.56	8.99	9.42
6	5.60	6.07	6.53	7.00	7.47	7.93	8.40	8.87	9.33	9.80	10.27
6½	6.20	6.72	7.23	7.75	8.27	8.78	9.30	9.82	10.33	10.85	11.37
7	6.80	7.37	7.93	8.50	9.07	9.63	10.20	10.77	11.33	11.90	12.47
7½	7.50	8.12	8.75	9.37	9.99	10.62	11.24	11.87	12.49	13.12	13.74
8	8.20	8.88	9.57	10.25	10.93	11.62	12.30	12.98	13.67	14.35	15.03
8½	8.90	9.64	10.38	11.12	11.86	12.60	13.34	14.09	14.83	15.57	16.31
9	9.60	10.40	11.20	12.00	12.80	13.60	14.40	15.20	16.00	16.80	17.60
9½	10.14	10.98	11.83	12.67	13.51	14.36	15.20	16.05	16.89	17.74	18.58
10	10.66	11.55	12.44	13.33	14.22	15.11	16.00	16.88	17.77	18.66	19.55
10½	11.20	12.13	13.07	14.00	14.93	15.87	16.80	17.73	18.67	19.60	20.53
11	11.74	12.71	13.69	14.67	15.65	16.63	17.60	18.58	19.56	20.54	21.52
11½	12 26	13.29	14.31	15.33	16.35	17.37	18.40	19.42	20.44	21.46	22.48
12	12.80	13.87	14.93	16.00	17.07	18.13	19.20	20.27	21.33	22.40	23.47

Fractions of sugar prices and beet tests to the nearest one-tenth in proportion. Prices of beets testing above or below percentages shown in table will be increased or diminished in the same proportion.

(Example: If the net price received for sugar during the period mentioned is eight and one-half ($8\frac{1}{2}$) cents per pound, the company will pay $14.83 per ton for beets testing 20 per cent in sugar. If the net price received for sugar is nine (9) cents per pound, the company will pay $16 per ton for beets testing 20 per cent in sugar.)

Initial payment shall be made for beets at a rate as high as may be consistent with the selling price of sugar after all beets are delivered. Further payments to be made from time to time as the net selling price of sugar may warrant. Final payment is to be made not later than August 1, 1924.

7. The company will also pay all railroad freights on beets loaded on cars, provided the cars are loaded to full capacity. All demurrage charges shall be paid by the grower. The freight on dirt above 5 per cent shall also be paid by the grower.

8. The company agrees to furnish all beet wagon nets.

9. The company shall have the right to deduct from any money due the grower under the terms of this contract all amounts due the company for seed furnished, money advanced, work performed, and any other obligation of said grower, also any amount due Union Commercial Co.

10. Field labor expense in connection with transportation, camps, wood, and water must be borne by the grower.

11. This contract can not be assigned without the written consent of the company.

12. Any water that may be furnished by the company will be for the purpose of irrigating beet crops covered by this agreement only, and will terminate upon harvesting of said crop of beets, and it is agreed that grower will not contend, and it is declared that there is no intention that there is any dedication to public service.

13. If factory of company shall be damaged by fire or other cause, preventing the working of said crop of beets, company may at its option pay grower fifteen dollars ($15) for each acre planted, leaving to grower the use of the land and the growing crop thereon. If such damage occurs before planting seed, this agreement is cancelled.

14. The grower may, at his own expense, have representatives (weighman, tareman, and chemist) in scale house, tare room, and laboratory, to inspect weights and work done, such representatives to be experienced in the line of work to be performed and satisfactory to the company.

15. The company guarantees the price of sugar to be not less than 5 cents per pound.

Date.....

Post office..... .....

GROWER

District.....

Owner of land.....

Description of land..... UNION SUGAR COMPANY

.....

.....

Loading station..... By.....

CHIEF AGRICULTURIST

1923

MEMORANDUM OF AGREEMENT between .....grower, and UNION SUGAR CO., Betteravia, Cal.

The UNION SUGAR CO., hereinafter called the company, and.....hereinafter called the grower, have agreed as follows:

1. The grower agrees that during the season of 1923 he will grow sugar beets upon about.....acres of land hereinbelow described, and that he will, in compliance with the directions of the company, which may be given from time to time, prepare said land and plant, replant, thin, cultivate, irrigate, harvest, and deliver said crop in good condition at the company's factory at Betteravia, as may be directed by the company; deliveries to be made not more than five days before the opening of the factory for the campaign of 1923 and not later than five days before the close of said campaign.

2. The company will furnish seed, for which the grower will pay fifteen (15) cents per pound; and no seed other than that furnished by the company shall be used in the planting or replanting of said crop.

3. Beets must not be irrigated after July 15, except by written permission or direction of the company.

4. The grower agrees to deliver beets free from stones, trash, or foreign substances liable to interfere with the work in the factory.

5. The company may deduct the weight of earth from the total weight of each lot of beets delivered; and may make proper deductions when beets are insufficiently topped.

6. The company will weigh and pay the grower for all beets delivered in accordance with this agreement and accepted by the company, at the rate of eight dollars ($8) per ton of 2,000 pounds. The company reserves the right to reject beets testing under twelve (12) per cent sugar and eighty (80) per cent purity.

7. The company will also pay all railroad freights on beets loaded on cars, provided the cars are loaded to full capacity. All demurrage charges shall be paid by the grower. The freight on dirt above 5 per cent shall also be paid by the grower.

8. The company agrees to furnish all beet wagon nets.

9. The company shall have the right to deduct from any money due the grower under the terms of this contract all amounts due the company for seed furnished, money advanced, work performed, and any other obligation of said grower, also any amount due Union Commercial Co.

10. Field labor expense in connection with transportation, camps, wood, and water must be borne by the grower.

11. This contract can not be assigned without the written consent of the company.

12. Any water that may be furnished by the company will be for the purpose of irrigating beet crops covered by this agreement only, and will terminate upon harvesting of said crop of beets, and it is agreed that grower will not contend, and it is declared that there is no intention that there is any dedication to public service.

13. If factory of company shall be damaged by fire or other cause, preventing the working of said crop of beets, company may at its option pay grower fifteen dollars ($15) for each acre planted, leaving to grower the use of the land and the growing crop thereon. If such damage occurs before planting seed, this agreement is cancelled.

14. The grower may, at his own expense, have representatives (weighman, tareman, and chemist) in scale house, tare room, and laboratory, to inspect weights and work done, such representatives to be experienced in the line of work to be performed and satisfactory to the company.

Date.....

Post office..... .....

GROWER

District.....

Owner of land.....

Description of land..... UNION SUGAR COMPANY

.....

.....

Loading station..... By.....

CHIEF AGRICULTURIST

TABLE XIX(*A*).—WORLD PRODUCTION OF CANE SUGAR IN TONS

Country	Harvesting period	1912–13	1913–14	1914–15
United States:				
Louisiana	Oct.–Jan.	153,573	292,697	242,700
Texas	Oct.–Jan.	9,000	7,840	3,815
Porto Rico	Jan.–June	398,002	364,024	345,159
Hawaiian Islands	Nov.–July	546,799	617,036	646,448
Virgin Islands	Jan.–June	7,503	6,496	5,040
Cuba	Dec.–June	2,719,961	2,909,460	2,903,787
British West Indies:				
Trinidad	Jan.–June	47,411	62,147	65,948
Barbados	Jan.–June	12,856	37,393	36,487
Jamaica	Jan.–June	9,775	17,453	16,871
Antigua	Feb.–July	8,305	17,186	12,678
St. Kitts	Feb.–Aug.	11,967	9,694	14,202
Other British	Jan.–June	6,608	8,735	7,328
French West Indies:				
Martinique	Jan.–July	44,194	44,955	43,718
Guadeloupe	Jan.–July	42,352	29,299	44,371
San Domingo	Jan.–June	94,820	118,471	121,259
Hayti	Dec.–June	.....	.....	.....
Mexico	Dec.–June	166,513	143,297	123,200
Central America:				
Guatemala	Jan.–June	12,000	12,500	15,000
Other	Jan.–June	12,640	12,140	25,628
South America:				
Demerara	Oct.–Dec. May–June	93,993	118,956	130,617
Surinam	Oct.–Jan.	10,734	15,680	13,440
Venezuela (exports)	Oct.–Dec.	1,307	4,335	4,470
Ecuador	Oct.–Feb.	7,474	4,905	7,834
Peru	Jan.–Dec.	202,772	251,384	289,730
Argentine	May–Nov.	162,311	308,996	370,324
Brazil	Oct.–Feb.	164,450	177,003	219,793
Total, North and South America	.....	4,947,320	5,592,082	5,709,847
British India (used locally)	Dec.–May	2,893,632	2,566,480	2,755,842
Java	May–Nov.	1,490,922	1,425,107	1,459,410
Formosa and Japan	Nov.–June	126,672	175,896	243,212
Philippine Islands (exports)	Nov.–June	173,825	260,692	232,600
Total, Asia	.....	4,685,051	4,428,175	4,691,064
Australia	June–Nov.	145,357	298,219	275,977
Fiji Islands	June–Nov.	106,075	103,165	108,528
Total, Australia and Polynesia	.....	251,432	401,384	384,505
Egypt (used locally)	Jan.–June	84,470	77,692	84,827
Mauritius	Aug.–Jan.	238,626	279,670	310,643
Reunion	Aug.–Jan.	43,196	40,076	43,979
Natal	May–Oct.	102,343	103,211	114,927
Mozambique	May–Oct.	30,580	37,421	40,344
Total, Africa	.....	499,215	538,070	594,720
Europe: Spain	Dec.–June	14,585	8,131	6,167
Total cane sugar production	.....	10,397,603	10,967,842	11,386,303
Yearly increase or decrease, world production (est.)	.....	128,936	570,239	418,461
Grand total cane and beet sugar	.....	20,308,958	20,527,472	20,612,613
Per cent of cane sugar to world production of sugar	.....	51.2	53.4	55.2

* Concerning Sugar, p. C, 1922.

[a] Latest estimates of Willett & Gray.

OF 2,000 POUNDS FOR THE YEARS 1912–13 TO 1922–23 INCLUSIVE.*

1915–16	1916–17	1917–18	1918–19	1919–20	1920–21	1921–22	[a] 1922–23
137,500	303,900	243,599	280,898	120,999	169,116	324,429	295,095
1,120	7,000	1,120	4,630	.....	6,987	3,270	3,220
483,095	502,395	463,633	406,132	485,884	491,113	431,200	379,071
593,482	644,571	576,839	603,583	555,725	569,399	548,800	523,040
16,520	8,721	6,048	10,080	13,888	5,040	5,600	6,720
3,368,865	3,386,566	3,859,613	4,448,839	4,177,686	4,408,365	4,475,953	4,480,000
71,939	79,398	50,687	53,920	65,426	61,525	58,240	61,600
64,999	62,111	73,058	84,304	60,792	27,795	40,320	56,000
16,960	31,731	38,416	48,160	52,500	44,800	47,227	42,560
20,767	19,092	10,538	14,382	17,405	12,678	11,032	13,440
18,039	16,854	9,908	12,209	11,240	9,031	9,437	16,800
6,067	8,855	18,754	8,490	6,329	4,035	10,347	11,200
43,596	38,576	23,387	11,230	21,389	26,694	20,528	22,064
38,204	40,499	34,028	29,796	28,560	28,477	35,840	33,600
141,185	145,792	142,601	177,306	196,824	207,812	252,000	212,800
.....	.....	.....	3,696	4,620	6,300	13,757	13,440
72,800	56,000	44,800	78,400	103,040	128,800	134,176	134,400
17,392	16,800	25,546	15,054	16,912	19,600	21,381	22,400
21,808	17,427	20,600	15,949	22,400	41,050	31,329	31,360
133,382	128,007	121,163	120,467	95,599	107,708	120,265	113,263
9,239	12,555	10,908	8,960	13,440	10,521	11,200	12,320
9,973	20,313	11,851	18,706	19,841	25,139	17,637	17,920
8,340	3,445	8,818	7,716	8,408	7,714	7,716	8,960
305,337	279,077	316,889	324,627	363,759	379,218	358,248	380,800
164,572	92,669	96,671	143,476	329,267	222,839	192,903	224,000
212,524	272,943	282,070	205,048	198,414	380,871	364,000	476,000
5,977,705	6,195,297	6,491,545	7,136,058	6,990,347	7,402,627	7,546,835	7,592,073
2,953,300	3,055,360	3,708,320	2,654,400	3,415,056	2,807,078	2,800,000	3,346,560
1,342,395	1,787,715	1 991,746	1,959,337	1,496,055	1,689,806	1,847,563	1,939,700
374,575	532,090	445,332	465,559	327,500	383,237	455,802	454,496
372,017	226,974	242,211	218,724	224,456	286,544	378,560	319,200
5,042,287	5,602,139	6,387,609	5,298,020	5,463,067	5,166,665	5,481,925	6,059,956
178,843	215,971	363,171	235,035	181,774	204,289	334,545	343,479
134,288	107,408	79,296	89,600	98,560	81,760	72,800	58,240
313,131	323,379	442,467	324,635	280,334	286,049	407,345	401,719
110,840	114,052	89,027	85,007	97,117	89,271	112,000	100,800
240,260	234,119	252,522	283,102	263,749	291,057	204,102	258,933
39,479	47,660	56,231	37,266	36,216	47,128	43,224	44,800
125,531	128,330	119,000	207,200	159,993	169,680	180,320	177,208
41,128	40,406	47,926	22,724	42,710	56,227	38,581	50,400
557,238	564,567	564,706	635,299	599,785	653,363	578,227	632,141
4,770	5,053	7,759	7,295	6,667	7,590	5,512	6,720
11,895,131	12,690,435	13,894,086	13,401,307	13,340,200	13,516,294	14,019,844	14,692,609
508,828	795,304	1,203,651	[b] 492,779	[b] 61,107	176,094	503,550	672,765
18,932,346	19,081,702	19,452,222	17,661,999	16,959,174	18,698,719	19,569,646	20,448,334
62.8	66.5	71.4	75.9	78.7	72.3	71.6	71.9

Weekly Statistical Sugar Trade Journal, New York, July 5, 1923. [b] Decrease.

TABLE XIX(*B*).—World Production of Beet Sugar in Tons

Country	Harvesting period	1912–13	1913–14	1914–15	1915–16
Europe:					
Germany	Sept.–Jan.	3,011,692	2,885,753	2,909,333	1,909,404
Czecho-Slovakia	Sept.–Jan.				
Austria	Sept.–Jan.	2,116,254	1,854,816	1,766,232	1,114,866
Hungary	Sept.–Jan.				
France	Sept.–Jan.	1,078,973	790,790	333,954	149,801
Belgium	Sept.–Jan.	330,969	252,481	225,137	124,667
Holland	Sept.–Jan.	349,355	252,710	333,399	267,587
Russia (Ukraine, Poland, etc.)	Sept.–Jan.	1,549,804	1,890,335	2,203,416	1,852,884
Russia and Ukraine	Sept.–Jan.	.....	.....	.....	.....
Poland	Sept.–Jan.	.....	.....	.....	.....
Sweden	Sept.–Jan.	162,553	153,532	176,229	142,593
Denmark	Sept.–Jan.	167,328	163,184	171,860	140,224
Italy	Sept.–Jan.	218,628	361,921	183,753	253,529
Spain	Sept.–Jan.	163,988	154,756	111,617	122,953
Switzerland	Sept.–Jan.	3,360	5,180	13,832	17,920
Bulgaria	Sept.–Jan.	7,840	8,234	24,484	12,982
Roumania	Sept.–Jan	38,274	38,928	33,600	34,720
Total in Europe	.....	9,199,018	8,812,620	8,486,846	6,144,130
North America:					
United States	July–Jan.	698,952	733,934	723,808	873,327
Canada	Oct.–Dec.	13,385	13,076	15,656	19,758
Total N. America.	.....	712,337	747,010	739,464	893,085
Total beet-sugar production	.....	9,911,355	9,559,630	9,226,310	7,037,215
Estimated yearly increase or decrease in world production	.....	2,265,970	[b]351,725	[b]333,320	[b]2,189,095
Grand total cane and beet-sugar production	.....	20,308,958	20,527,472	20,612,613	18,932,346
Per cent of beet sugar to total world production of sugar	.....	48.8	46.6	44.8	37.2

* Concerning Sugar, p. C, 1922.

[a] Latest estimates of Willett & Gray, Weekly Statistical Sugar Trade Journal,

[b] Decrease.

OF 2,000 POUNDS FOR THE YEARS 1912–13 TO 1922–23 INCLUSIVE.*

1916–17	1917–18	1918–19	1919–20	1920–21	1921–22	[a] 1922–23
1,768,001	1,733,655	1,488,838	815,204	1,270,908	1,466,059	1,680,000
1,041,122	736,612	668,868	544,295	778,135	727,415	812,000
			13,394	16,509	17,992	26,853
				36,376	82,560	78,400
203,034	220,752	121,359	170,244	336,247	306,740	571,200
148,845	144,277	81,772	161,948	267,406	319,519	301,136
296,717	219,683	191,178	263,110	349,645	414,465	291,200
1,480,192	1,152,010	377,010				
.....	.....	.....	97,094	99,109	55,299	216,600
.....	.....	.....	156,800	212,614	252,000	369,605
168,000	140,000	142,763	162,481	183,897	254,240	80,408
126,336	153,216	161,952	171,194	151,015	164,416	98,988
154,322	110,230	117,596	201,548	149,344	239,750	291,200
131,827	148,761	153,671	90,003	188,187	148,811	179,238
9,240	9,800	12,096	9,576	4,155	6,160	8,960
10,105	11,729	2,734	12,291	8,777	24,640	18,200
16,800	.....	.....	.....	5,600	28,000	28,000
5,554,541	4,780,725	3,519,837	2,869,182	4,057,924	4,494,400	5,051,988
822,726	764,811	755,879	731,312	1,085,749	1,020,533	689,848
14,000	12,600	24,976	18,480	38,752	21,203	13,889
836,726	777,411	780,855	749,792	1,124,501	1,041,736	703,737
6,391,267	5,558,136	4,300,692	3,618,974	5,182,425	5,549,802	5,755,725
[b] 645,948	[b] 833,131	[b] 1,297,444	[b] 641,718	1,563,451	367,377	205,923
19,081,702	19,452,222	17,661,999	16,959,174	18,698,719	19,569,646	20,448,334
33.5	28.6	24.3	21.3	27.7	28.4	28.1

July 5, 1923.

APPENDIX C

TABLE XX.—Imports of Sugar (Quantities) into the Continental United States from Principal Sources of Supply, 1890 to 1922 Inclusive *

(In thousand tons of 2,000 pounds)

Fiscal year	Porto Rico	Hawaiian Islands	Philippine Islands	Cuba	Dutch East Indies	Europe	North and Central America	West Indies [a]	South America	All other	Total
July 1–*June* 30											
1890	38.5	112.2	129.9	520.5	56.0	314.0	2.9	178.1	106.6	8.3	1,467.0
1891	40.0	156.1	46.3	715.3	68.2	335.7	2.9	178.8	185.5	12.9	1,741.7
1892	40.2	131.3	48.6	991.8	70.5	152.0	2.7	165.8	162.6	12.8	1,778.3
1893	49.8	144.8	61.2	921.8	91.7	235.0	11.4	209.2	144.2	14.1	1,883.2
1894	37.8	163.3	62.0	1,063.8	144.0	289.8	4.1	181.0	202.8	24.0	2,172.6
1895	28.2	137.2	34.4	922.9	140.2	198.1	6.0	134.7	150.2	35.4	1,787.3
1896	40.8	176.1	72.5	546.6	283.8	386.1	2.7	174.3	178.3	87.0	1,948.2
1897	43.3	215.6	36.2	288.9	317.1	1,041.6	1.3	235.2	192.1	88.2	2,459.5
1898	49.2	249.9	14.7	220.1	310.9	119.8	4.7	170.5	162.6	42.6	1,345.0
1899	53.6	231.2	25.8	331.8	493.2	387.5	6.3	203.8	134.0	122.9	1,990.1
1900	36.3	252.4	24.7	352.7	581.1	356.4	3.3	173.9	164.5	63.7	2,009.0
1901	68.6	345.4	2.3	549.7	389.0	511.8	4.1	180.0	310.2	40.4	2,401.5
1902	91.9	360.3	5.7	492.1	318.4	175.7	6.0	161.3	325.3	31.4	1,968.1
1903	113.1	387.4	9.4	1,198.2	445.9	66.5	7.0	173.5	175.9	31.6	2,608.5
1904	129.6	368.2	30.8	1,409.8	220.2	4.5	6.1	93.3	71.7	14.0	2,348.2

1905	135.7	416.4	39.0	1,028.8	449.7	115.1	15.8	101.3	84.3	6.4	2,392.5
1906	205.3	373.3	34.7	1,391.0	390.9	28.3	3.4	75.7	65.0	0.6	2,568.2
1907	204.1	410.5	12.6	1,618.2	224.3	201.5	5.9	56.6	76.3	0.5	2,810.5
1908	234.6	538.8	19.2	1,154.6	294.8	113.2	17.2	71.1	15.4	0.5	2,459.4
1909	244.2	511.4	41.8	1,431.1	458.4	67.9	4.8	47.9	42.0	0.9	2,850.4
1910	284.5	555.3	87.9	1,754.8	157.4	1.9	4.6	10.1	29.9	0.7	2,887.1
1911	322.9	505.6	115.2	1,673.8	114.0	32.9	1.7	14.0	16.7	0.7	2,797.5
1912	367.1	602.7	217.8	1,593.3	170.2	7.0	4.6	20.7	38.0	0.8	3,022.2
1913	382.7	542.7	101.6	2,155.9	6.4	92.1	1.5	2.0	10.0	0.5	3,295.4
1914	320.6	557.4	58.4	2,463.3	.....	1.5	2.8	2.2	4.7	0.5	3,411.4
1915	294.5	640.4	163.4	2,392.4	.....	2.0	41.7	49.0	60.4	1.6	3,645.4
1916	424.9	568.6	108.6	2,575.4	.....	.....	17.1	55.5	59.3	0.6	3,810.0
1917	488.7	581.3	133.9	2,334.5	.....	.....	25.7	81.7	79.1	11.5	3,736.4
1918	336.5	540.5	86.8	2,280.4	.....	.....	20.4	21.7	38.0	4.3	3,328.6
Jan. 1–*Dec.* 31											
1919	354.2	579.5	87.9	3,343.1	15.5	.....	23.3	24.1	17.5	0.4	4,445.5
1920	413.1	549.9	145.9	2,881.1	273.1	60.4	112.7	129.1	262.0	172.5	4,999.8
1921	469.3	541.1	164.9	2,590.1	17.0	1.6	38.7	146.4	24.1	1.9	3,995.1
1922[b]	360.3	567.7	276.5	4,527.1	.....	.....	35.1	5.8	3.2	13.2	5,788.9

* Commerce and Navigation of United States.

[a] Excluding Cuba and Porto Rico.

[b] Preliminary figures.

TABLE XXI.—Imports of Sugar (Percentages) into Continental United States from Principal Sources of Supply, 1890 to 1922 Inclusive

Fiscal year July 1–June 30	Porto Rico	Hawaiian Islands	Philippine Islands	Cuba	Dutch East Indies	Europe	North and Central America	West Indies	South America	All other	Total
1890	2.6	7.6	8.9	35.5	3.8	21.4	0.2	12.1	7.3	0.6	100.0
1891	2.3	9.0	2.6	41.0	3.9	19.3	0.2	10.3	10.7	0.7	100.0
1892	2.3	7.4	2.7	55.8	4.0	8.5	0.2	9.3	9.1	0.7	100.0
1893	2.6	7.7	3.2	49.0	4.9	12.5	0.6	11.1	7.7	0.7	100.0
1894	1.7	7.5	2.9	49.0	6.6	13.3	0.2	8.4	9.3	1.1	100.0
1895	1.6	7.7	1.9	51.6	7.9	11.1	0.3	7.5	8.4	2.0	100.0
1896	2.1	9.0	3.7	28.1	14.6	19.8	0.1	8.9	9.2	4.5	100.0
1897	1.8	8.8	1.5	11.7	12.9	42.3	0.1	9.5	7.8	3.6	100.0
1898	3.7	18.6	1.1	16.4	23.1	8.9	0.3	12.7	12.1	3.1	100.0
1899	2.7	11.6	1.3	16.7	24.8	19.5	0.3	10.2	6.7	6.2	100.0
1900	1.8	12.6	1.2	17.5	28.9	17.7	0.2	8.7	8.2	3.2	100.0
1901	2.8	14.4	0.1	22.9	16.2	21.3	0.2	7.5	12.9	1.7	100.0
1902	4.7	18.3	0.3	25.0	16.2	8.9	0.3	8.2	16.5	1.6	100.0
1903	4.3	14.9	0.4	45.9	17.1	2.5	0.3	6.7	6.7	1.2	100.0
1904	5.5	15.7	1.3	60.0	9.4	0.2	0.3	4.0	3.0	0.6	100.0

1905	5.7	17.4	1.6	43.0	18.8	4.8	0.7	4.2	3.5	0.3	100.0
1906	8.0	14.5	1.4	54.2	15.2	1.1	0.1	3.0	2.5	.....	100.0
1907	7.3	14.6	0.4	57.6	8.0	7.2	0.2	2.0	2.7	.....	100.0
1908	9.5	21.9	0.8	47.0	12.0	4.6	0.7	2.9	0.6	.....	100.0
1909	8.5	17.9	1.5	50.2	16.1	2.4	0.2	1.7	1.5	.....	100.0
1910	9.9	19.2	3.0	60.8	5.5	0.1	0.2	0.3	1.0	.. ..	100.0
1911	11.5	18.1	4.1	59.8	4.1	1.2	0.1	0.5	0.6	.....	100.0
1912	12.2	19.9	7.2	52.7	5.6	0.2	0.2	0.7	1.3	.....	100.0
1913	11.6	16.5	3.1	65.4	0.2	2.8	.....	0.1	0.3	.....	100.0
1914	9.4	16.4	1.7	72.2	.....	.....	0.1	0.1	0.1	.....	100.0
1915	8.1	17.6	4.5	65.6	.....	0.1	1.1	1.3	1.7	.....	100.0
1916	11.2	14.9	2.9	67.6	.....	.....	0.4	1.5	1.5	.....	100.0
1917	13.1	15.5	3.6	62.5	.....	.....	0.7	2.2	2.1	0.3	100.0
1918	10.1	16.2	2.6	68.5	.....	.....	0.6	0.7	1.2	0.1	100.0
1919	8.0	13.0	2.0	75.0	0.3	.....	0.5	0.8	0.4	.....	100 0
1920	8.3	11.0	2.9	57.6	5.5	1.2	2.3	2.6	5.2	3.4	100.0
1921	11.8	13.5	4.1	64.8	0.4	.....	1.0	3.7	0.6	0.1	100.0
1922	6.2	9.8	4.8	78.2	... .	.....	0.6	0.1	0.1	0.2	100.0

APPENDIX D

EFFECT OF TARIFF CHANGES ON PRICES AND PRODUCTION

Graphic method of showing the effect of a change in the duty on sugar upon the price and upon the relative quantities of foreign and domestic sugar consumed in the United States.

Explanation of Figure 8 and Inferences to be Drawn from It.—The construction is similar to that of figures 1 and 2 (pp. 108, 111.) For each region the output of each establishment is laid off along the line *OX* as the base of a rectangle, of which the altitude represents the cost of producing a pound of sugar in that establishment. The establishments are ranged according to cost. For each region, therefore, the upper bases of the rectangles form a broken line resembling a flight of steps. At the extreme right of the diagram is a curve representing the United States demand line, so drawn that if the total supply offered in the United States market is laid off along *OX*, the height of a vertical line drawn from the right-hand extremity of this distance to the demand curve will represent the price in the United States market. It will be seen from the nature of the construction that the greater the supply offered the less the price.

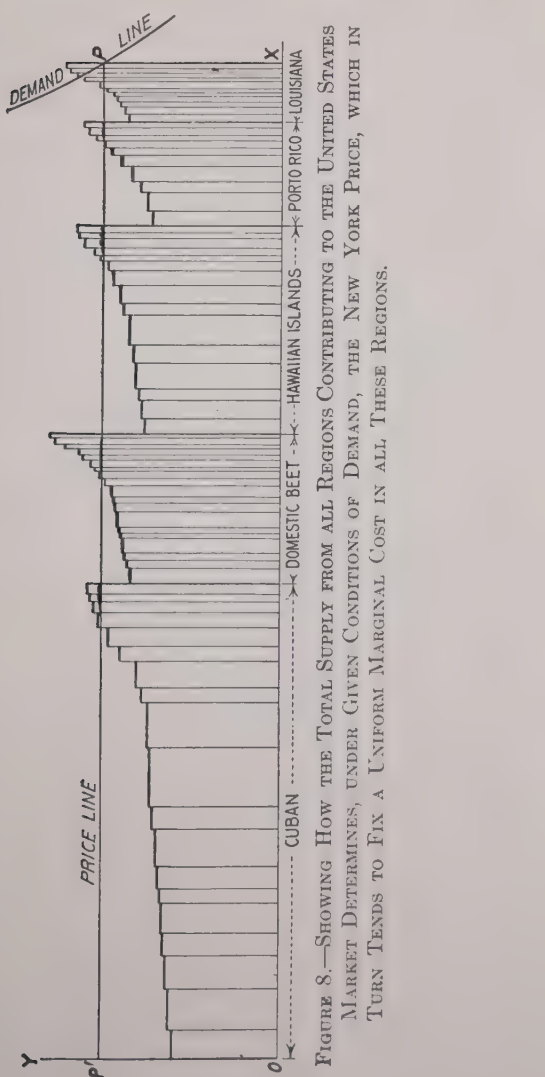


FIGURE 8.—SHOWING HOW THE TOTAL SUPPLY FROM ALL REGIONS CONTRIBUTING TO THE UNITED STATES MARKET DETERMINES, UNDER GIVEN CONDITIONS OF DEMAND, THE NEW YORK PRICE, WHICH IN TURN TENDS TO FIX A UNIFORM MARGINAL COST IN ALL THESE REGIONS.

The distance OX, being the sum of the outputs of all the establishments offered in the United States market, is clearly the total supply. The distance $PX = P'O$, therefore, represents the price. Assuming that equilibrium has been attained between production and demand and that in the cost are included transportation charges and the duty, if any, to the competitive market, then the point where the price line PP' intersects the cost lines for each of the regions will represent the marginal cost for that region. Obviously, the marginal costs for all the regions are equal to one another and equal to the price. It will be noted that in each region a small portion of the supply is produced at a cost greater than the price, and hence is produced at a loss. The producers in this situation constitute the "extra marginal fringe" (p. 114).

Study of the diagram will show that the operation of economic forces is always tending to keep the price and the marginal costs in all regions at a parity. Assuming demand and costs of production to remain constant, any increase in total supply would tend to lower the price and hence the profits of all producers in all regions. Production would therefore fall off, the total supply would be reduced, and the price improve until it has reached its former level. A decrease in supply would improve the price and stimulate production in all regions; as the supply increased, the price would fall until again it had reached its former level. Hence, so long as the demand and the costs of production remain the same, fluctuations from the

supply, price, and marginal cost shown in the diagram can be but temporary.

Suppose, however, that demand were to strengthen, as is normally to be expected from growth in population and increasing appreciation for sugar. This would be shown by moving the demand curve to a position parallel to its present position, but above and to the right of it. Until the supply had increased beyond OX, a vertical line drawn from X to the demand curve would be longer than PX; that is, the price would rise. The increased price would stimulate production; but as production increased, the price would fall until a new equilibrium had been attained. Assuming that all the establishments retain their former costs of production and that those costs can not be decreased, then the increased supply called for by the increased demand could be forthcoming only at an increased marginal cost. The cost line in each of the regions would be extended a little to the right and upward. When the new equilibrium had been attained, it would be found that the point X was farther to the right and the price marginal-cost line somewhat higher.

However, progress in the arts and sciences is constantly tending to reduce costs of production. The effect of such progress would be shown by a lowering of the cost line in all the regions. The lowered cost would increase profits and stimulate production. The increased production, however, would tend to lower the price line and check the increase in profits. A new equilibrium would be

found with both the cost and price lines lower than in the diagram, but with a supply larger than *OX* and with the price line intersecting the demand curve farther to the right and lower down.

In actual experience, factors tending to increase demand and factors tending to lower cost are both active. Both, as just shown, tend to increase the total output, but the former tend to increase marginal cost and price and the latter to lower them. During the last thirty years the latter has on the whole prevailed; and in spite of the enormous increase in consumption the *real* price (the price measured in terms of other commodities) has declined (p. 153). Because of the decline in purchasing power of the dollar, especially in recent years, *money* prices have risen.

The foregoing discussion deals with the economic forces affecting the price and output of sugar irrespective of the tariff. The effect of imposing a duty may be shown by another diagram.

Explanation of Figure 9 and Inferences from It.—Construction is similar to that of figure 8, except that the cost lines are represented as continuously ascending straight lines instead of ascending steps and that the "extra marginal" fringe of production in each region is omitted.

Before the Imposition of the Duty.—The total output is *OX*. A vertical line drawn from *X* meets the demand line at *P*. *PQ* is thus the price line. The contributions to the total supply are indicated by the distances between the vertical full lines, and the cost lines from the several regions, by upward-

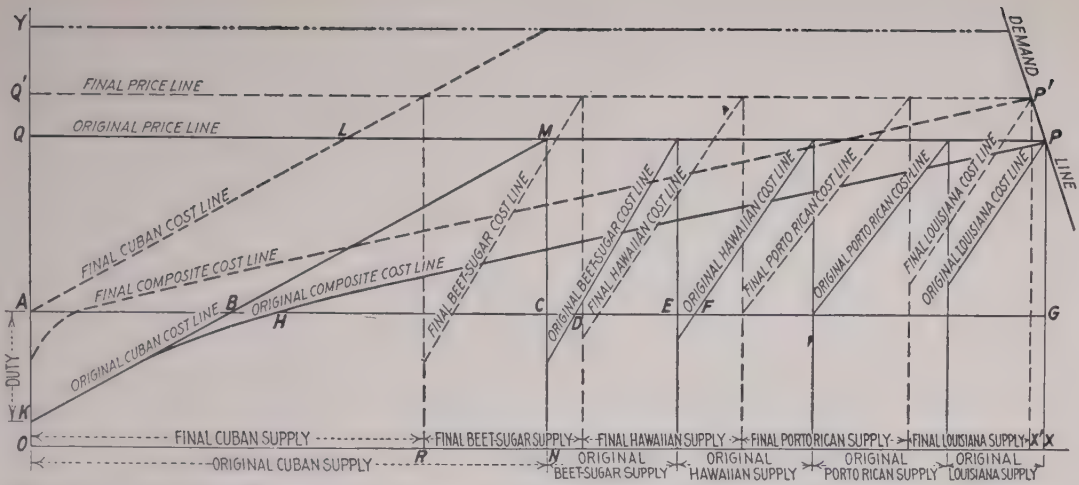


FIGURE 9.—SHOWING EFFECT OF AN INCREASE IN DUTY ON THE OUTPUT AND MARGINAL COST OF SUGAR IN CUBA AND IN THE SEVERAL REGIONS OF DOMESTIC PRODUCTION; ALSO THE EFFECT ON THE NEW YORK PRICE.

sloping full lines. From the nature of the construction it will be noted that, as in figure 8, the marginal costs in all regions are equal to each other and equal to the price.

If at any level above OX a horizontal line be drawn cutting all the cost lines, then (regarding this line as a price line) the output that would be forthcoming from each region at that price can be easily determined. For example, if AG is the supposed price line, then at that price the output from Cuba would be AB, the output of beet sugar would be CD, and the output of Hawaiian sugar EF. There would at that price be no production in Porto Rico and Louisiana. The total output would, therefore, be the sum $(AB+CD+EF)$. Construct AH equal to this sum. By making a similar construction for other assumed price lines, a composite cost line may be easily constructed.

After the Imposition of the Duty.—Suppose a duty indicated by AK imposed. Then the cost for all Cuban producers is increased (so far as the American market is concerned) by the duty, and hence the new Cuban cost line will be parallel to its former position and above it by the distance AK. So long as there is no change in supply the price will remain PX. The new Cuban cost line cuts the price line at L. Hence, that portion of the former Cuban output indicated by LM will be produced at a loss, and accordingly Cuban sugars will to some extent retire from the American market, thus reducing the total supply. As the supply declines, the price will improve, and this process will go on until

a new equilibrium is found. To find the final equilibrium output and price a new composite cost line may be constructed by the same process as that used in constructing the former composite cost line, except that the Cuban contributions at the various assumed prices should be measured to the final Cuban cost line instead of the original Cuban cost line. The final composite cost line cuts the demand line at P'. As the domestic cost lines are in no wise affected by the tariff, they may all be drawn parallel to their former positions, starting at the same lower level as before and terminating at their upper extremity in the final price line.

When the construction is completed, it will be found that the total supply has decreased (from OX to OX'), the Cuban supply has also decreased (from ON to OR), while the output from each of the domestic regions has increased. The price has increased from OQ to OQ', the increase (QQ') being less than the increase in duty ($QY = AK$).

The relation of the increase in price to the increase in duty depends on the elasticity of the demand curve and the relative elasticities of the foreign and domestic cost curves. The elasticity of demand or supply may be sufficiently defined for the present purpose by stating that the greater the percentage change in output that accompanies a given percentage change in price the more elastic is the demand or supply. Without attempting a full demonstration it may be stated that the proportion which the increase in price bears to the increase in duty increases as the elasticity of the foreign

supply increases and decreases as the elasticities of the demand and domestic supply increase.

By comparing the total consumption of sugar in the United States with the prices for the period 1890–1914 a demand curve for sugar was constructed and the coefficient of elasticity found to be about 0.7. Constructing a diagram similar to figure 9 with cost curves derived from the charts in "Costs of Production in the Sugar Industry"[1] and a demand curve with a coefficient of elasticity of 0.7, the increase in price normally to be expected from an increase in duty of 1 cent per pound at the present time was found to be about 0.8 of a cent.

[1] Costs of Production in the Sugar Industry: U. S. Tariff Com. Tariff Information Ser. 9, Appendix B, 1919.

APPENDIX E

TABLE XXI.—Average Annual New York Prices of 96° Centrifugals and Refined Granulated and Refiners' Margin, 1890–1923 Inclusive.*

(In cents per pound)

Year	96° centrifugal	Refiners' margin	Refined granulated
1890	5.5	0.7	6.2
1891	3.9	0.8	4.7
1892	3.3	1.1	4.4
1893	3.7	1.1	4.8
1894	3.2	0.9	4.1
1895	3.3	0.9	4.2
1896	3.6	0.9	4.5
1897	3.6	0.9	4.5
1898	4.2	0.8	5.0
1899	4.4	0.5	4.9
1900	4.6	0.7	5.3
1901	4.0	1.1	5.1
1902	3.5	1.0	4.5
1903	3.7	0.9	4.6
1904	4.0	0.8	4.8
1905	4.3	1.0	5.3
1906	3.7	0.8	4.5
1907	3.8	0.9	4.7
1908	4.1	0.8	4.9
1909	4.0	0.8	4.8
1910	4.2	0.8	5.0
1911	4.5	0.8	5.3
1912	4.2	0.9	5.1
1913	3.5	0.8	4.3
1914	3.8	0.9	4.7
1915	4.7	0.9	5.6
1916	5.8	1.1	6.9
1917	6.3	1.4	7.7
1918	6.4	1.4	7.8
1919	7.5	1.4	8.9
1920	13.0	...	12.7
1921	4.7	1.5	6.2
1922	4.7	1.2	5.9
1923	7.1	1.3	8.4

* Wholesale Prices, 1890–1922: U. S. Bur. Labor Statistics Bull. 335, pp. 90–91, 1923.

APPENDIX F

COSTS OF PRODUCING CUBAN AND DOMESTIC SUGARS

Tables reproduced from Report of United States Tariff Commission, December 1, 1923: "A Preliminary Statement of Cost Data Secured in Pending Sugar Investigation, the Subject of a Public Hearing, January 15, 1923." The table numbers are those of the present publication, with the Tariff Commission's original numbers in brackets.

TABLE XXII [Table II].—AVERAGE COSTS OF SUGAR PRODUCTION IN THE UNITED STATES AND CUBA, AS REPORTED IN PREVIOUS GOVERNMENTAL INQUIRIES

(Costs are by poundage [a] in cents per pound)

Crop years	U. S. beet		Louisiana		Hawaii	Porto Rico	Cuba	Costs of refining cane sugar
	Refined	Raw [b] basis	First [c] basis	Raw [d] basis				
Pre-war	4.123	3.492	4.480	4.101	2.898	2.828	1.700	0.631
1916–17	4.357	3.287	4.605	3.963	3.853	4.229	2.904	1.070
1917–18	5.498	4.199	6.471	5.692	5.339	4.568	3.931	1.299
1918–19	7.149	5.845	8.307	7.525	5.119	5.769	4.104	1.304
1919–20	8.954	.....	14.156	.....	8.944	9.190	6.788	
1920–21	8.296	.....	10.931					

[a] That is to say, the total of the expenditures of all the factories combined has been divided by the total production of all the factories combined. An average by factories, on the other hand, is the average of the unit costs of the individual factories.

[b] The figures in this column have been obtained by subtracting the cost of refining for each year, as shown in the last column, from the cost of producing refined beet sugar.

[c] The figures in this column represent average costs for all grades of sugar produced in Louisiana combined—plantation granulated, yellow clarified, etc.

[d] The figures in this column are obtained by reducing the Louisiana costs indicated in the preceding column by amounts equal to six-tenths of the reduction made for beet sugar as explained in footnote [b] (above).

TABLE XXIII [Table VIII].—Comparison of Average Raw Cane-sugar Costs in Cents per Pound, 1921 and 1922 Crops—In Various Regions of the United States and Cuba

Items of cost	Cuba		Hawaii		Porto Rico		Louisiana	
	1921	1922	1921	1922	1921	1922	1921–22 crop	1922–23 crop
Cost of cane	2.4487	1.1583	2.5941	2.6362	3.5195	2.9335	2.4919	3.5314
Manufacturing expense	0.4568	0.2758	0.4695	0.3533	0.6051	0.3575	0.8226	0.7655
Repairs and maintenance	0.4314	0.1386	0.1295	0.0972	0.2383	0.1860	0.2971	0.3418
Administration and general	0.2788	0.1696	0.5487	0.3112	0.3343	0.2255	0.1627	0.1764
Fixed charges, including interest[a]	0.3980	0.4232	0.6199	0.6266	0.2611	0.4092	0.4640	0.4897
Total above	4.0137	2.1655	4.3617	4.0245	4.9583	4.1117	4.2383	5.3048
Credit for receipts from by-products	0.0382	0.0191	0.0228[b]	0.0110[c]	0.0858	0.0623	0.2702	0.4483
Net cost f.o.b. mill: Including interest	3.9755	2.1464	4.3389	4.0135	4.8725	4.0494	3.9681	4.8565
Amount of interest	0.0931	0.1496	0.0307	0.0409	0.0597	0.1047	0.1650	0.1731
Excluding interest	3.8824	1.9968	4.3082	3.9726	4.8128	3.9447	3.8031	4.6834
Marketing cost in cents per pound produced	0.4129	0.2265	0.6530	0.4734	0.3755	0.2621	0.1559	0.1204

[a] Includes only money actually paid out on loans, bonded indebtedness, and cumulative preferred stock, if any. Rent has also been included only where money has been actually paid out. The amounts are, however, relatively small.

[b] Includes miscellaneous credits of 0.0022 cent per pound.

[c] Includes miscellaneous credits of 0.009 cent per pound.

TABLE XXIV [Table IX].—Cost per Pound Beet-sugar Production, 1921–22 and 1922–23 Crops *

Items of cost	Average cost in cents per pound	
	1921–22 crop	1922–23 crop
Cost of beets	2.8765	3.3729
Manufacturing expense	1.0844	1.1062
Repairs and maintenance	0.2589	0.3067
Administration and general	0.2240	0.2921
Fixed charges including interest [a]	0.6097	0.7153
Collateral operations affecting manufacturing cost	0.0865	0.1009
Total above	5.1400	5.8941
Receipts from by-products	0.1129	0.3047
Net cost f.o.b. mill:		
Including interest	5.0271	5.5894
Amount of interest	0.2665	0.1905
Excluding interest	4.7606	5.3989
Marketing costs:		
Per pound produced	0.8871	1.0465
Per pound marketed	0.8210	0.8033

* Beet sugar is produced in the United States only in the form of refined sugar, so that the costs shown in the table are not comparable with costs of raw cane sugar without allowance for the cost of conversion of the raw into refined.

[a] Includes only money actually paid out on loans, bonded indebtedness, and cumulative preferred stock, if any. Rent has also been included only where money has been actually paid out.

TABLE XXV [Table X].—Proportions of Raw Cane-sugar Production in the United States and Cuba Produced at Various Costs, 1921 Crops *

Approx. per cent production covered by cost data[a]	Cuba		Hawaii		Porto Rico		Louisiana[b] 1921–22 crop	
	Cost	Per cent total production	Cost	Per cent total production	Cost	Per cent total production	Cost	Per cent total production
25	3.32	23.83	3.72	23.47	4.30	25.01	3.14	22.91
50	4.13	50.16	4.20	51.52	4.84	52.31	3.65	49.94
55	4.21	54.80	4.22	55.21				
60	4.35	60.67	4.33	61.06	5.02	59.32	3.68	59.82
65	4.40	64.74	4.45	62.63				
70	4.57	69.62	4.46	70.49	5.24	75.83	3.75	68.25
75	4.70	75.65	4.50	75.46				
80	4.71	79.11	4.78	82.03	5.27	81.30	4.35	81.31
85	5.00	85.46	5.00	85.06	5.31	84.23		
87½	5.16	88.07	5.67	87.77	5.39	88.33		
90	5.17	90.76	5.72	88.87	.....	.....	4.60	90.24
92½	5.22	92.09	5.85	92.40	6.24	92.54		
95	5.81	95.01	6.08	94.86	.....	.....	4.85	95.42
97½	5.85	96.74	6.32	97.48	6.30	98.46	5.43	96.56
100	6.76	100.00	9.01	100.00	6.63	100.00	5.64	100.00

* Costs f.o.b. mill in cents per pound at and under which various proportions of crops were produced.

[a] This column is meant only as approximate guide to percentages of production for each cost group. Actual percentages are given to the right of each cost figure.

[b] Includes only the 18 mills producing raw sugar as main product.

TABLE XXVI [Table XI].—Proportions of Raw Cane-sugar Production in the United States and Cuba Produced at Various Costs, 1922 Crops *

Approx. per cent production covered by cost data[a]	Cuba		Hawaii		Porto Rico[b]		Louisiana[c] 1922–23 crop	
	Cost	Per cent total production	Cost	Per cent total production	Cost	Per cent total production	Cost	Per cent total production
25	1.87	24.770	3.41	23.712	3.31	22.65	4.3029	25.8200
50	2.11	49.890	3.97	49.669	3.67	49.16	4.6547	52.9630
55	2.16	55.030	4.06	53.651	3.73	55.99	4.6860	56.3550
65	2.29	65.280	4.24	67.338	3.98	65.22	4.9247	64.7000
70	2.32	68.760	.....	.....	4.36	70.22	5.0466	70.2572
75	2.34	74.750	4.31	74.907	4.50	74.23	5.2305	74.1780
80	2.42	80.165	4.44	79.961	4.96	79.14	5.2530	78.2087
85	2.49	85.159	4.75	85.277	4.97	84.83	5.3356	85.3105
87½	2.51	87.245	.....	.....	5.02	87.78	5.3370	87.2123
90	2.55	89.877	4.84	90.903	5.18	90.36	5.4146	89.6569
92½	2.64	92.375	5.05	92.593	5.27	92.74	5.6592	92.9368
95	3.13	95.160	5.47	94.972	5.34	95.78	5.8086	95.2067
97½	3.58	97.490	5.66	97.614	.....	.....	5.9361	97.6706
100	3.80	100.000	7.79	100.000	7.25	100.00	9.2483	100.0000

* Costs f.o.b. mill in cents per pound at and under which various proportions of crops were produced.

[a] This column is meant only as approximate guide to percentages of production for each cost group. Actual percentages are given to the right of each cost figure.

[b] Some of the figures in this column are nominal, inserted to conceal the identity of the individual mills.

[c] Includes the 33 mills (out of a total of 77) which produced raw sugar as main product. A table of the above form for the other Louisiana sugar is shown in Table XXVII [Table XII].

TABLE XXVII [Table XII].—Proportion of United States Beet-sugar Crop and Louisiana Direct Consumption Sugars Produced at Various Costs, 1921–22 Crop *

(Costs f.o.b. mill in cents per pound at and under which various proportions of the beet-sugar crop were produced.)

Approx. per cent total productions covered by cost data [a]	U. S. beet		Louisiana clarified (13 mills)		Louisiana plantation granulated [b] (41 mills)	
	Cost	Per cent total production	Cost	Per cent total production	Cost	Per cent total production
25	4.31	23.55	4.16	25.87	4.47	25.11
50	4.76	50.29	4.81	48.37	5.02	48.93
55	4.86	55.03	4.84	53.27	5.12	56.93
60	5.00	60.49	....	....	5.16	60.15
65	5.15	64.98	....	....	5.39	64.60
70	5.46	70.50	....	....	5.56	69.63
75	5.69	74.23	4.92	75.32	5.70	75.33
80	5.78	80.46	5.07	81.04	5.90	78.63
85	5.96	85.21	....	....	6.21	84.46
87½	6.14	87.85	....	....	6.29	87.79
90	6.28	89.63	5.70	89.56	6.33	90.13
92½	6.42	92.45	....	....	6.89	91.91
95	6.65	95.33	5.99	93.74	6.98	96.36
97½	6.96	97.66	....	....	7.00	97.82
100	9.03	100.00	6.82	100.00	7.72	100.00

* The cost figures are for refined sugars of various grades, so that the costs shown in the table are not comparable with costs of raw cane sugar without allowance for the cost of conversion of the raw into refined.

[a] This column is meant only as approximate guide to percentages of production for each cost group. Actual percentages are given to the right of each cost figure.

[b] Includes 10 companies producing fine granulated mainly.

TABLE XXVIII [Table XIII].—Proportion of United States Beet-sugar Crop and Louisiana Direct Consumption Sugars Produced at Various Costs, 1922–23 Crop *

(Costs f.o.b. mill in cents per pound at and under which various proportions of the beet sugar crop were produced).

Approx. per cent total productions covered by cost data [a]	U. S. beet		Louisiana clarified (13 mills)		Louisiana plantation granulated [b] (31 mills)	
	Cost	Per cent total production	Cost	Per cent total production	Cost	Per cent total production
25	4.83	23.68	5.53	26.59	5.25	26.60
50	5.37	49.69	6.25	52.19	5.96	48.19
55	5.55	55.07	....	....	5.98	54.60
65	5.67	65.76	6.45	63.75	6.14	61.51
70	5.85	69.81	....	....	6.23	71.24
75	5.97	75.64	....	....	6.59	74.62
80	6.20	79.60	6.49	79.56	6.77	79.12
85	6.37	85.27	....	....	6.80	84.01
87½	6.43	87.07	....	....	6.90	87.62
90	6.55	89.72	6.61	90.91	7.64	91.21
92½	6.68	92.70	....	....	7.68	93.58
95	7.10	95.12	7.38	95.47	7.69	95.48
97½	7.49	97.39	....	....	7.84	97.58
100	10.33	100.00	7.72	100.00	8.11	100.00

* The cost figures are for refined sugars of various grades, so that the costs shown in the table are not comparable with costs of raw cane sugar without allowance for the cost of conversion of the raw into refined.

[a] This column is meant only as approximate guide to percentages of production for each cost group. Actual percentages are given to the right of each cost figure.

[b] Includes five companies producing fine granulated mainly.

TABLE XXIX [Table XVIII].—Cost of Refining Raw Cane Sugar in the United States

(Cost in cents per hundred pounds of refined sugar f.o.b. refinery)

1921		1922	
Refining cost	Per cent total production refined sugar [a]	Refining cost	Per cent total production refined sugar [a]
At or under $1.003	20.77	At or under $0.804	18.30
$1.004 to 1.189	27.36	$0.805 to 0.885	13.20
1.190 to 1.253	6.17	0.886 to 0.952	13.60
1.254 to 1.392	8.23	0.953 to 0.987	5.80
1.393 to 1.487	17.56	0.988 to 1.122	25.60
1.488 to 1.524	14.32	1.123 to 1.139	16.20
Over 1.524	5.59	Over 1.139	7.30
	100.00		100.00
Average $1.2575		Average $1.0087	

[a] Percentages have been arranged in such form as to conceal identity of individual refining companies. Number of refineries included, 14.

APPENDIX G

STATUS OF THE PHILIPPINE ISLANDS

For the purposes of this study sugar from the Philippine and Virgin islands has been classed as domestic sugar. It is admitted free of duty. Its marginal cost, its price, and in general the part played by it in the tariff problem call for the same economic treatment as sugars from the Hawaiian islands and Porto Rico.

In so treating Philippine sugars, however, it is not to be understood that the Institute commits itself in any way with respect to the political status of the Philippine Islands. The following references in the tariff act of 1922 should be noted:

Title I, Section 1. That on and after the day following the passage of this act, except as otherwise specially provided for in this act, there shall be levied, collected, and paid upon all articles when imported from any foreign country into the United States or into any of its possessions (except the Philippine Islands, the Virgin Islands, and the islands of Guam and Tutuila) the rates of duty which are prescribed by the schedules and paragraphs of the dutiable list of this title.

Title IV, Section 401. When used in this title— * * * (*j*) The term "United States" includes all

Territories and possessions of the United States, except the Philippine Islands, the Virgin Islands, and the islands of Guam and Tutuila.

It will be noted also (see Appendix H) that the same regions are excepted from the operation of the rates determined by the "flexible" provision (Title III, Section 315). The Philippine Islands have a customs tariff different from that of the United States, though between them and the United States there is free trade in articles which are the growth and manufacture of either region (Title III, Section 301). It therefore logically follows that they should be excepted from the operation of the rates (Title I and Title III, Section 315), and from the Administrative provisions (Title IV) provided for in the act. However, they are by implication in the same paragraphs "possessions" of the United States, but whether or not, in determining rates under Section 315, Philippine sugars are to be classed as domestic sugars when comparing costs of production is not explicitly stated. The Tariff Commission after giving consideration to arguments on both sides has decided not to consider Philippine sugars in arriving at its estimate of "the domestic cost of production."

APPENDIX H

THE FLEXIBLE PROVISION OF THE ACT OF 1922

Section 315. (*a*) That in order to regulate the foreign commerce of the United States and to put into force and effect the policy of the Congress by this act intended, whenever the President, upon investigation of the differences in costs of production of articles wholly or in part the growth or product of the United States and of like or similar articles wholly or in part the growth or product of competing foreign countries, shall find it thereby shown that the duties fixed in this act do not equalize the said differences in costs of production in the United States and the principal competing country he shall, by such investigation, ascertain said differences and determine and proclaim the changes in classifications or increases or decreases in any rate of duty provided in this act shown by said ascertained differences in such costs of production necessary to equalize the same. Thirty days after the date of such proclamation or proclamations such changes in classification shall take effect, and such increased or decreased duties shall be levied, collected, and paid on such articles when imported from any foreign country into the United States or into any of its possessions (except the Philippine Islands, the

Virgin Islands, and the islands of Guam and Tutuila): *Provided*, That the total increase or decrease of such rates of duty shall not exceed 50 per centum of the rates specified in Title I of this act, or in any amendatory act.

(*b*) That in order to regulate the foreign commerce of the United States and to put into force and effect the policy of the Congress by this act intended, whenever the President, upon investigation of the differences in costs of production of articles provided for in Title I of this act, wholly or in part the growth or product of the United States and of like or similar articles wholly or in part the growth or product of competing foreign countries, shall find it thereby shown that the duties prescribed in this act do not equalize said differences, and shall further find it thereby shown that the said differences in costs of production in the United States and the principal competing country can not be equalized by proceeding under the provisions of subdivision (*a*) of this section, he shall make such findings public, together with a description of the articles to which they apply, in such detail as may be necessary for the guidance of appraising officers. In such cases and upon the proclamation by the President becoming effective the ad valorem duty or duty based in whole or in part upon the value of the imported article in the country of exportation shall thereafter be based upon the American selling price, as defined in subdivision (*f*) of section 402 of this act, of any similar competitive article manufactured or produced in the United States embraced within the class or kind of

imported articles upon which the President has made a proclamation under subdivision (*b*) of this section.

The ad valorem rate or rates of duty based upon such American selling price shall be the rate found, upon said investigation by the President, to be shown by the said differences in costs of production necessary to equalize such differences, but no such rate shall be decreased more than 50 per centum of the rate specified in Title I of this act upon such articles, nor shall any such rate be increased. Such rate or rates of duty shall become effective fifteen days after the date of the said proclamation of the President, whereupon the duties so estimated and provided shall be levied, collected, and paid on such articles when imported from any foreign country into the United States or into any of its possessions (except the Philippine Islands, the Virgin Islands, and the islands of Guam and Tutuila). If there is any imported article within the class or kind of articles, upon which the President has made public a finding, for which there is no similar competitive article manufactured or produced in the United States, the value of such imported article shall be determined under the provisions of paragraphs (1), (2) and (3) of subdivision (*a*) of section 402 of this act.

(*c*) That in ascertaining the differences in costs of production, under the provisions of subdivisions (*a*) and (*b*) of this section, the President, in so far as he finds it practicable, shall take into consideration (1) the differences in conditions in production, including wages, costs of material, and other items

in costs of production of such or similar articles in the United States and in competing foreign countries; (2) the differences in the wholesale selling prices of domestic and foreign articles in the principal markets of the United States; (3) advantages granted to a foreign producer by a foreign government, or by a person, partnership, corporation, or association in a foreign country; and (4) any other advantages or disadvantages in competition.

Investigations to assist the President in ascertaining differences in costs of production under this section shall be made by the United States Tariff Commission, and no proclamation shall be issued under this section until such investigation shall have been made. The commission shall give reasonable public notice of its hearings and shall give reasonable opportunity to parties interested to be present, to produce evidence, and to be heard. The commission is authorized to adopt such reasonable procedure, rules, and regulations as it may deem necessary.

The President, proceeding as hereinbefore provided for in proclaiming rates of duty, shall, when he determines that it is shown that the differences in costs of production have changed or no longer exist which led to such proclamation, accordingly as so shown, modify or terminate the same. Nothing in this section shall be construed to authorize a transfer of an article from the dutiable list to the free list or from the free list to the dutiable list, nor a change in form of duty. Whenever it is provided in any paragraph of Title I of this act, that the duty or duties shall not exceed a specified ad valorem rate

upon the articles provided for in such paragraph, no rate determined under the provision of this section upon such articles shall exceed the maximum ad valorem rate so specified.

(*d*) For the purposes of this section any coal-tar product provided for in paragraphs 27 or 28 of Title I of this act shall be considered similar to or competitive with any imported coal-tar product which accomplishes results substantially equal to those accomplished by the domestic product when used in substantially the same manner.

(*e*) The President is authorized to make all needful rules and regulations for carrying out the provisions of this section.

(*f*) The Secretary of the Treasury is authorized to make such rules and regulations as he may deem necessary for the entry and declaration of imported articles of the class or kind of articles upon which the President has made a proclamation under the provisions of subdivision (*b*) of this section and for the form of invoice required at time of entry.

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